Council of State and Territorial Epidemiologists

Occupational Health Indicators:

A Guide for Tracking Occupational Health Conditions and Their Determinants

Last updated August 2012

Changes from the April 2011 version are highlighted

Council of State and Territorial Epidemiologists

**In Collaboration with the National Institute for Occupational Safety and Health
Centers for Disease Control and Prevention**

Authors' Notes

This document is intended to provide guidance to states for generating Occupational Health Indicators for the years 2003 – 2009. In some instances, these "how-to" guides will be applicable for generating data prior to 2003. If you are trying to generate Occupational Health Indicator (OHI) data prior to 2003 and are experiencing difficulty, please contact Erin Simms (esimms@cste.org) or LaKesha Robinson (lrobinson@cste.org) at CSTE for technical assistance.

Questions about data collection and analysis for any specific OHI may be directed to the state and national lead representatives of the indicator in question (Appendix D). Questions about the OHI Work Group, which collectively manages OHI updates and additions for this document, may be directed to the Work Group Co-chairs (Appendix D).

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> **This document is intended to provide guidance to states regarding the minimal level of occupational health surveillance activity. The CSTE recommends that every state should have the ability to collect and utilize data from this minimal list of indicators on a regular basis.**

INTRODUCTION

In 1998, the Council of State and Territorial Epidemiologists (CSTE), in association with the National Institute for Occupational Safety and Health (NIOSH), convened the NIOSH-States Occupational Health Surveillance Work Group to make recommendations to NIOSH concerning State-based surveillance activities for the coming decade. The original Work Group members (see Appendix A) agreed that the surveillance planning process should be outcome driven; e.g., begin with the identification of occupational injuries, illnesses and hazards to be placed under surveillance. The Work Group also identified a number of surveillance issues that cut across specific conditions and made several recommendations to NIOSH for the implementation of comprehensive State-based occupational health surveillance systems (CSTE 2001). A draft of the Work Group report contributed to the NIOSH Surveillance Strategic Plan (NIOSH 2001).

The Work Group report described draft "profiles" for priority conditions to be placed under surveillance as part of State-based surveillance systems. Since the publication of the Work Group report, public health surveillance "indicators" have been developed in several areas, including chronic disease, injury control and environmental health (CSTE 1999, STIPDA 1999, CDC 2001, CSTE 2002). These indicators are a construct of public health surveillance that define a specific measure of health or risk status (i.e., the occurrence of a health event or of factors associated with that event) among a specified population. Surveillance indicators allow a state to compare its health or risk status with that of other states and evaluate trends over time within the state, and guide priorities for prevention and intervention efforts. **Occupational health indicators** can provide information about a population's health status with respect to workplace injuries and illnesses or to factors that can influence health. These indicators can either be measures of health (work-related disease or injury) or factors associated with health, such as workplace exposures, hazards or interventions.

This document describes the current recommended set of indicators for occupational health surveillance by the Work Group. The occupational health indicators that have been developed represent the consensus view of state and NIOSH representatives, and are intended as advisory to the states. The indicators represent a core set of data that, if collected at the state level, would assist in the development of programs to prevent workplace injuries and illnesses. They are a subset of the larger number of conditions that were recommended for surveillance in 2001. The indicators are intended to be used in conjunction with other guidelines for the state-based surveillance of occupational injuries and illnesses (NIOSH 1995, CSTE 2001), and to be used as a complement to overall state and national goals to improve the health of the population (CDC 2000). Members of the current Work Group are listed in Appendix C.

Background

State health agencies, which are vested with the legal authority to require disease reporting and collect other health data, play a central role in public health surveillance. Whereas public health surveillance was once focused primarily on infectious diseases, it has expanded in recent years to include surveillance of a wide range of health outcomes and their determinants, including chronic diseases, injuries and health behaviors (Halperin 1998). National statistics on occupational injuries and illnesses have been collected largely outside of the public health infrastructure and rely almost entirely on data reported by employers. State health agencies that have access to a wide variety of public health data systems have an important role in the surveillance of occupational diseases, injuries and hazards. State health agencies are in a unique position to:

- Provide critically needed data on occupational diseases. State health agencies can augment and complement employer-based systems to fill the information gap using a variety of existing health data sources (e.g., death certificates, hospital discharge data, physician reports).

- Generate information necessary to evaluate the conventional occupational injury data sources. Both the annual Survey of Occupational Injuries and Illnesses and the Occupational Safety and Health Administration (OSHA) Data Initiative are based on employer reports of occupational injuries and illnesses. There has been longstanding concern about the accuracy of records maintained by employers (NRC 1987). State surveillance systems – derived from multiple data sources – can be used to supplement the Bureau of Labor Statistics (BLS) data sources to better understand the true economic and human burden of occupational diseases and injury.

- Link surveillance findings with intervention efforts at the State and local levels. State agencies are in a critical position to work with employers, labor unions, health and safety professionals, and community-based organizations to develop and disseminate feasible and effective interventions that can prevent targeted workplace illnesses, injuries and fatalities.

- Integrate occupational health into mainstream public health. Building surveillance programs at the state level that are actively linked to intervention efforts provides an opportunity to integrate occupational health into mainstream public health. Collaborations with partners outside the occupational health infrastructure such as school-based programs or community health clinics may yield benefits in disseminating prevention strategies to reduce the incidence of occupational injuries and illnesses.

In a nationwide surveillance system, all states should have core capacity to conduct a minimum level of surveillance of occupational injuries and illnesses (CSTE 2008). At a minimum, this capacity should include personnel and resources to conduct surveillance of basic occupational indicators using existing data systems, and the ability to develop working relationships with federal, state and local partners in both the public and private sectors. States and their partners may also conduct more in-depth surveillance, follow-up and intervention for specific, targeted diseases, injuries and hazards.

Methods for indicator development

From 2001 through 2003, the Work Group members developed an approach for indicator selection, and then subsequently drafted and finalized the set of occupational health indicators. The following criteria were considered in selecting the indicators:

- *Availability of easily obtainable state-wide data*. Access to existing data was considered a critical element in the development of the indicator set. The Work Group recognized that some states might have access to other sources of data for occupational health surveillance, and that additional indicators may be developed, as these data will allow. However, this document sets out a "core" or minimum set of occupational health indicators that relies on data that should be available to most states.

- *Public health importance of the occupational health effect or exposure to be measured*. This criterion was used in identifying health effect and exposure indicators. Factors considered in determining public health importance included the magnitude or extent of the effect or exposure, severity of the health effect, economic impact, emergent status of the condition, and degree of public concern.

- *Potential for workplace intervention activities.* The indicator should inform program and policy development at the state level to protect worker safety and health.

The Work Group reviewed a number of sources to guide the selection of the final indicator set. This included CSTE recommendations for the surveillance of occupational injuries and illnesses, surveillance case definitions from the published literature, and indicators developed in other public health domains (CSTE 1999, STIPDA 1999, CDC 2001, CSTE 2002).

A total of 19 indicators were selected by Work Group consensus:

- 12 **Health effect** indicators (measures of injury or illness that indicate adverse effects from exposure to known or suspected occupational hazards),

- 1 **Exposure** indicator (measures of markers in human tissue or fluid that identify the presence of a potentially harmful substance resulting from exposure in the workplace),

- 3 **Hazard** indicators (measures of potential for worker exposure to health and safety hazards in the workplace),

- 2 **Intervention** indicators (measures of intervention activities or intervention capacity to reduce workplace health and safety hazards), and

- 1 **Socioeconomic impact** indicator (measure of the economic impact of work-related injuries and illnesses).

In 2009, a thirteenth health effect indicator (Low Back Disorder Hospitalizations) was developed and pilot tested. The Work Group voted to adopt this as the twentieth indicator.

In addition, the Work Group recommended that states develop a profile of employment demographics.

The Work Group acknowledges significant limitations in the design of these indicators, both intrinsic to the nature of the indicators as well as to the data sources upon which they rely. While the indicators should be implemented in all states, some states will not have all of the data resources available to them.

The indicator pilot project and development of "how to" guides

The Work Group recognized the need to pilot the indicators to assess the feasibility of widespread implementation and to develop specific guidance on how to compute the proposed measures. In summer 2002, the five "Core" states with NIOSH Cooperative Agreements to conduct "Core Occupational Health Surveillance" (California, Massachusetts, Michigan, New York, and Washington) (see Appendix B) agreed to both pilot-test the indicators and to create user-friendly "how-to" guides so that other states could calculate the indicators. This pilot project met one of the established goals of the NIOSH Core Surveillance program: "to develop models for other states that can be used to establish a comprehensive, nationwide system of state-based occupational injury and illness surveillance."

An implementation plan was agreed upon, and the states worked on the indicators independently, communicating primarily through conference calls and e-mail. All five pilot states did each indicator; however, individual states took the lead on the various indicators, becoming the primary authors of the "how to" guides for their respective indicators. These guides and the indicator data were shared among the states. Monthly conference calls were held to discuss data issues including, for example, clarification of numerators and denominators, and inconsistencies in the data sources between the states.

Based upon the results of the pilot, the Core States and Work Group worked together to redefine the indicators and finalize the "how to" documents. For example, Indicator 8 ("Carpal Tunnel Syndrome Cases Filed with the State Workers' Compensation System") was modified from the original indicator of "Musculoskeletal Disorders Filed with the State Workers' Compensation System" because of difficulties in defining and obtaining information on all musculoskeletal disorders. Because of differences among states with regards to their data systems, particularly Workers' Compensation data, more general "how-to" guides were developed for indicators 5 and 8 ("Amputations and Carpal Tunnel Syndrome Cases Filed with the State Workers' Compensation System").

Subsequent to the initial pilot testing by the five Core states, eight additional states (Connecticut, Maine, Nebraska, New Jersey, New Mexico, North Carolina, Oregon and Wisconsin) pilot tested the "how to" guides. Feedback from these additional states were incorporated into the development of final "how to" guides in November 2004. Using these guides, thirteen states generated indicator data for 2000 and the results were published in September 2005 ("Putting Data to Work: Occupational Health Indicators from Thirteen Pilot States for 2000"). Annual state and national data are also provided on the CSTE website.

Due to changes (e.g., website addresses, coding schemes) inherent in the data sources used to generate the indicators, the "how to" guides have been updated. Each year, states review the instructions to ensure that up-to-date information is provided.

These indicators and the "how-to" guides are meant to assist states in building a capacity for occupational health surveillance. Results from the pilot project showed that the process of generating the indicators is as useful as the data itself. All states will not be able to complete all indicators, nor will the indicators alone provide all of the information necessary for a state occupational health program. However, the process of generating the indicators will help raise awareness and build capacity for using available data, and also open dialogues among occupational health partners within the state. The indicator data itself will be most useful when multiple years of data have been compiled and potential problems with rate instability can be minimized and trends across multiple years can be observed within each state. Due to significant differences in data sources, comparing data across states for certain indicators is not recommended. These limitations are discussed in the individual section for each indicator. The design and implementation of any public health surveillance system should be evaluated according to established criteria (MMWR 2001). Several factors should be considered in the design and evaluation of any occupational health surveillance system:

- Underreporting by employees and health care providers of occupational injuries and illnesses;
- Inadequate health care provider recognition of occupational injuries and illnesses;
- Failure by employers and/or health care providers to report cases according to applicable state laws;
- Difficulties in attributing diseases with long latency from time of exposure to disease manifestation and/or from multifactorial causes (e.g., silicosis, lung cancer);
- Possible exclusion of at-risk populations from surveillance (e.g., self-employed, military);
- Variations in coding the causes of injury, illness or death; and
- Differences in underlying populations at risk ("denominators")

The Work Group remains committed to ensuring the ongoing viability of this project and assisting all 50 States to address the important public health issue of work-related injury and illness.

Council of State and Territorial Epidemiologists

The Council of State and Territorial Epidemiologists enhances the ability of state and other health agencies to detect, prevent, and control diseases and risks of public health significance. CSTE does this by developing and building effective relationships among state and other health agencies. As a professional organization, CSTE represents public health epidemiologists working in state and territorial health agencies. CSTE has <mark>over 800</mark> members with surveillance and epidemiologic expertise in a broad range of areas including chronic disease, communicable disease, immunization, environmental health, occupational health, and injuries. The organization frequently provides technical advice and assistance to federal agencies, including the Centers for Disease Control and Prevention (CDC), on matters of state-based epidemiology. CSTE is an affiliate organization of the Association of State and Territorial Health Officials (ASTHO), the professional organization of chief public health executives in each state and territory.

Topic:	DEMOGRAPHICS
PROFILE: EMPLOYMENT DEMOGRAPHICS	
Demographic Group:	Employed persons
Numerator:	Employed persons 16 years or older by specific demographic characteristics
Denominator:	Employed population 16 years or older for the same calendar year
Measures of Frequency:	1. Percentage of civilian workforce unemployed. 2. Percentage of civilian employment self-employed. 3. Percentage of civilian employment employed part-time. 4. Percentage of civilian employment by number of hours worked (<40, 40, 41+) per week. 5. Percentage of civilian employment by sex. 6. Percentage of civilian employment by age group (16-17, 18-64, 65+ years of age). 7. Percentage of civilian employment by race (White, Black, Other). 8. Percentage of civilian employment by Hispanic origin. 9. Percentage of civilian employment by industry. 10. Percentage of civilian employment by occupation.
Time Period:	Calendar year
Significance and Background:	There are nearly 140 million civil, non-institutional workers in the United States of which 47% are female, 18% are of a racial minority, and 14% are of Hispanic origin (Bureau of Labor Statistics, Geographic Profile of Employment and Unemployment). In addition, 20% of those employed work part-time. The makeup of the workforce differs between states and may be important in understanding the occupational health status between and within a state.
Rationale:	Work-related injuries and illnesses are preventable, and control of occupational hazards is the most effective means of prevention. Research has shown relationships between demographic characteristics of workers and the risk of occupational injury or illness. Understanding the basic characteristics of a state's workforce will help state health departments assess possible occupational health risks for their state.
Limitations of Indicator:	These indicators are not direct measures of occupational risk for a state's workforce or for individual workers.
Data Resources:	BLS Geographic Profiles of Employment and Unemployment (http://www.bls.gov/gps/home.htm) (numerator for all measures of frequency, except age). BLS Geographic Profiles of Employment and Unemployment (denominator, except age). Current Population Survey (CPS) micro-data (http://dataferrett.census.gov) for age.
Limitations of Data Resources:	The Geographic Profiles data are based on the Current Population Survey (CPS), which is a monthly probability sample of households across the United States. Geographic Profiles excludes workers less than 16 years of age, active-duty members of the military, and inmates in institutions. These data may underestimate the percentage of certain racial or ethnic worker populations that do not have permanent residences, or are migratory in nature. Additional information is available at http://www.bls.gov/gps/home.htm.
HP2020 Objectives[1]:	None
CSTE Positions:	None
Other Available Data:	Data are available to report cross tabulations of many of these demographic indicators, including tabulations by major industry or occupation divisions on the Geographic Profiles website. Information on age distribution, education, unionization, and income are available from the CPS micro-data, which states may be able to utilize (http://dataferrett.census.gov).
Recommendations:	States could report the available cross tabulations of demographic indicators provided within the Geographic Profiles reports.

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[1] Throughout this document, Healthy People 2020 objectives corresponding to OHI measures may be tracked using different data sources.

P1. <u>Percentage of civilian workforce unemployed</u>
<u>To obtain the percentage:</u>
- Go to: http://www.bls.gov/opub/gp/laugp.htm. The webpage will be titled "Geographic Profile of Employment and Unemployment, 2010."
- Scroll down to "Geographic Profile of Employment and Unemployment, 2009." Click on the corresponding link to the PDF.
- Data are available in Table 14.
- Find your state.
- Within the Total row, find the value under Unemployment Rate.

P2. <u>Percentage of civilian employment self-employed</u>
a) <u>To obtain the number of self-employed workers:</u>
- Data are available in Table 21 of "Geographic Profile of Employment & Unemployment for 2009."
- The heading in the first column "Population group and area" should be "TOTAL."
- Find the row corresponding to your state.
- Add the data in the column titled "Agricultural industries Self-employed" and the data in the column titled "Nonagricultural industries Self-employed". Multiply the result by 1,000.

b) <u>To obtain the total employed civilians 16 years or older:</u>
- Using the table described in P2a, find the number listed under Total for your state (first data column).
- Multiply the listed number by 1,000.

c) <u>To calculate the percentage:</u>
- Divide the number of self-employed persons (P2a) by the number of employed persons (P2b).
- Multiply the result by 100 to get the **"Percentage of civilian employment self-employed"**.

P3. <u>Percentage of civilian employment in part-time jobs</u>
a) <u>To obtain the number of workers in part-time jobs:</u>
- Data are available in Table 16 of "Geographic Profile of Employment & Unemployment for 2009."
- Locate the table listing state employment levels by full- and part-time status.
- The heading in the first column "Population group and area" should be "TOTAL."
- Find the row corresponding to your state.
- Find the column headed "Total" under "Part-time workers." Multiply the listed number by 1,000.

b) <u>To obtain the total employed civilians 16 years or older:</u>
- Use P2b.

c) <u>To calculate the percentage</u>:
- Divide the number of part-time workers (P3a) by the total number employed (P3b).
- Multiply the result by 100 to get the **"Percentage of civilian employment in part-time jobs"**.

P4. <u>Percentage of civilian employment by number of hours worked</u>
a) <u>To obtain the number of employed persons by hours worked</u>:
- Data are available in Table 22 of "Geographic Profile of Employment & Unemployment for 2009."
- The heading in the first column "Population group and State" should be "TOTAL."
- Find the row corresponding to your state.
    - i) <u>0 to 39 hours worked</u>:
        - <u>0 hours worked</u>. These are individuals who worked 0 hours during the week of the survey (e.g., due to vacation, sick leave). To obtain the number of employees working 0 hours, multiply the number listed under "Total at work" by 1,000, then subtract this from the total employed civilians 16 years or older (P2b).
        - <u>1-14 hours worked</u>. Multiply the number listed in the column "1 to 14 hours" by 1,000.
        - <u>15-29 hours worked</u>. Multiply the number listed in the column "15 to 29 hours" by 1,000.
        - <u>30-34 hours worked</u>. Multiply the number listed in the column "30 to 34 hours" by 1,000.
        - <u>35-39 hours worked</u>. Multiply the number listed in the column "35 to 39 hours" by 1,000.
        - Sum the above together.

    - ii) <u>40 hours worked</u>:
        - Multiply the number listed in the column "40 hours" by 1,000.

    - iii) <u>41+ hours worked</u>:
        - <u>41-48 hours worked</u>. Multiply the number listed in the column "41 to 48 hours" by 1,000.
        - <u>49 hours and over worked</u>. Multiply the number listed in the column "49 hours and over" by 1,000.
        - Sum the above together.

b) <u>To obtain the total employed civilians 16 years or older</u>:
- Use P2b.

c) <u>To calculate the percentages</u>:
- Divide each of the subcategories by P4b.
- Multiply the result by 100 to get the **"Percentage of civilian employment by number of hours worked"**.

P5. <u>Percentage of civilian employment by sex</u>

a) <u>To obtain the number of employed males and females:</u>

- Data are available in Table 14 of "Geographic Profile of Employment & Unemployment for ==2009=="."

- Under 'Total', the second row lists data for 'Men'; the third row lists data for 'Women'.

- Find Employment Number. For each sex, multiply the listed number by 1,000.

b) <u>To obtain the total employed civilians 16 years or older</u>:

- Using the table described in P5a, find employment number for Total (listed just above "Men" and "Women").

- Multiply the listed number by 1,000.

c) <u>To calculate the percentages:</u>

- <u>Males</u>. Divide the number of males employed (P5a) by the total number employed (P5b). Multiply the result by 100.

- <u>Females</u>. Divide the number of females employed (P5a) by the total number employed (P5b). Multiply the result by 100.

P6. <u>Percentage of civilian employment by age group (16-17, 18-64, 65+ years of age)</u>

a) <u>To obtain the number of employed persons by age group:</u>

- Dataferrett is a US Census product described as a "data mining and extraction tool." Previously, users installed the DataFerrett application to their personal computer and ran programs from there. (These users can still use DataFerrett from their computer – if you are one of the users who in the past installed DataFerrett to your computer, please skip down five bullet points to "Previous & New Users" below.) New DataFerrett users will run the program from their internet browser.

- New Users: go to http://dataferrett.census.gov.

- On the homepage, you will find helpful information on DataFerrett on the righthand column, including a QuickTour, Tutorials, and a Users Guide.

- To initiate DataFerrett, click on "Get Data ~ Run" on the right side of the screen.

- Click on Dataferrett.

- Previous & New Users: register as user by typing your e-mail address into the box and clicking OK.

- Click on "Step1: Select Dataset and Variable" at the top of the page.

- Within "Select Dataset(s) to Search," click on the + sign for Current Population Survey. Then click on the + sign for Basic.

- Select the months of interest. Multiple months can be highlighted by clicking and simultaneously using the control key. (Alternatively: a range of months can quickly be selected by clicking on one month (e.g., January ==2009==), then clicking on another month (e.g., December ==2009==) while holding down the Shift key. All the months within the range should then be highlighted.)

- Select View Variables from the pop-up box.

- Select the following topics: "Labor Force Variables", "Geography Variables", and "Demographic Variables" and then select Search Variables at the bottom of that box.
- On the next screen all of the available variables for the selected topics will be displayed. Click on the heading "Name" to sort the variables alphabetically.
- Select the following variables and value ranges:
  - GESTCEN (Geography – census state code.) Click to highlight. Click on Browse/Select Highlighted Variables. Check the "Select" box on next pop-up screen. Click "Deselect all values." Check your State code, then click on 'OK'. Click on 'OK' to confirm and to add the variable to your DataBasket.
  - PEMLR (Labor force – employment status.) Click to highlight. Click on Browse/Select Highlighted Variables. Check the "Select" box on next pop-up screen. Click "Deselect all values" and then check "Employed – At Work" and "Employed – Absent" then click OK. Click on 'OK' to confirm and to add the variable to your DataBasket.
  - PRTAGE (Demographics – age top coded at 90 years old). Click to highlight. Click on Browse/Select Highlighted Variables. Check the "Select" box on next pop-up screen. Make the age range 16 to 90. Click on OK. Click on 'OK' again to confirm and to add the variable to your DataBasket.
- Click on "Step2: DataBasket/Download/Make a Table".
- Click on the "Make a Table" icon. You will then see an empty spreadsheet on the left side of your screen and a box on the right with the variables in the DataBasket.
- Using your mouse, pull the variable titled PRTAGE (i.e., "click and drag") from the right side to the top left corner of the empty spreadsheet and click on "GO Get Data" on the toolbar.
- In a few seconds the table will be populated with a total employment number for all of the single years of age between 16 and 90.
- The selections for the query are provided in simple SAS code on the right side of the screen. Verify that you have selected your state, ages between 16 and 90, "PEMLR=1" and "PEMLR=2" and the correct months of interest.
- Highlight the cells containing data in the spreadsheet. Select Copy from the Edit dropdown menu. Paste the copied cells into an Excel file.

  i)   16 to 17 year olds
- In Excel, sum the average annual number of employed persons corresponding to 16-17 year olds.

  ii) 18 to 64 year olds
- Follow the process above (i) for ages 18-64. (Note that if you simply highlight the values associated with the 18-64 group, Excel should illustrate the sum at the bottom of the screen.)

  iii) 65+ year olds
- Follow the process above (i) for ages 65 to 90 (equivalent to 65 and older). (Again, summation can be done by Excel by simply highlighting the appropriate values.)

b) To obtain the total employed civilians 16 years or older:

- Sum the average annual number of employed for each of the three age groups.

c) To calculate the percentage:
- 16 to 17 year olds. Divide the number of 16 to 17 year olds by the total employment (P6b). Multiply the result by 100.
- 18 to 64 year olds. Divide the number of 18 to 64 year olds by the total employment (P6b). Multiply the result by 100.
- 65+ year olds. Divide the number of 65+ year olds by the total employment (P6b). Multiply the result by 100.

P7. Percentage of civilian employment by race
a) To obtain the number of employed by race:
- For most states, data are available in Table 14 of "Geographic Profile of Employment & Unemployment for 2009." (If no data are provided for White and Black for your state in Table 14, you can obtain this information in Table 18 - look for "White" and "Black or African American" under the heading "Population group and State.")
- Find your state.
  i) White.
  - Find Employment Number listed for row titled "White." Multiply the number by 1,000.
  ii) Black.
  - Find Employment Number listed for row titled "Black." Multiply the number by 1,000.
  iii) Other.
  - Sum the number of Whites (P7ai) and the number of Blacks (P7aii). Subtract this number from the "Total employed civilians 16 years or older" (P5b).

b) To obtain the total employed civilians 16 years or older:
- Use P2b.

c) To calculate the percentage:
- White. Divide the number of Whites employed (P7ai) by the total number employed (P7b). Multiply the result by 100.
- Black. Divide the number of Blacks employed (P7aii) by the total number employed (P7b). Multiply the result by 100.
- Other. Divide the number of Other races employed (P7aiii) by the total number employed (P7b). Multiply the result by 100.

P8. Percentage of civilian employment by Hispanic origin
a) To obtain the number of Hispanic origin employed:
- For most states, data are available in Table 14 of "Geographic Profile of Employment & Unemployment for 2009." (If no data are provided for Hispanic origin for your state in Table 14, you can obtain this information in Table 18 - look for "Hispanic or Latino ethnicity" under the heading "Population group and State.")
- Find your state.
- Find Employment Number listed for row titled "Hispanic or Latino ethnicity."

- Multiply the number by 1,000.

b) <u>To obtain the total employed civilians 16 years or older:</u>
- Use P2b.

c) <u>To calculate the percentage:</u>
- Divide the number of Hispanic origin employed (P8a) by the total employment (P8b). Multiply the result by 100.

P9. Percentage of civilian employment by industry
- Data are available in Table 20 of "Geographic Profile of Employment & Unemployment for 2009."
- The heading in the first column "Population group and State" should be "TOTAL."
- Find the row corresponding to your state.
- Find the percent of the total employed in the various industries.

Prior to 2003, these categories were:
- Construction
- Manufacturing – Durable goods
- Manufacturing – Non-durable goods
- Transportation/communications/public utilities
- Trade
- Finance/insurance/real estate
- Services
- Government
- Agriculture.

Starting in 2003, the categories are:
- Mining
- Construction
- Manufacturing – Durable goods
- Manufacturing – Nondurable goods
- Wholesale and retail trade
- Transportation and utilities
- Information
- Financial activities
- Professional and business services
- Education and health services
- Leisure and hospitality
- Other services
- Public administration
- Agriculture and related.

P10. Percentage of civilian employment by occupation
- Data are available in Table 18 of "Geographic Profile of Employment & Unemployment for 2009."

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- Find the row corresponding to your state.
- Find the percent of the total employed in the various occupations.

Prior to 2003, these categories were:
- Executive/administrative/managerial
- Professional specialty
- Technicians and related support
- Sales
- Administrative support including clerical
- Service
- Precision production/craft/repair
- Machine operators/assemblers/inspectors
- Transportation/material moving
- Handlers/equipment cleaners/helpers/laborers
- Farming/forestry/fishing.

Starting in 2003, the categories are:
- Management, business and financial operations
- Professional and related
- Service
- Sales and related
- Office and administrative support
- Farming, fishing, and forestry
- Construction and extraction
- Installation, maintenance, and repair
- Production
- Transportation and material moving.

Topic:	**OCCUPATIONAL INJURIES AND ILLNESSES COMBINED**
INDICATOR #1:	**NON-FATAL WORK RELATED INJURIES AND ILLNESSES REPORTED BY EMPLOYERS**
Demographic Group:	Employed persons in the private sector
Numerator:	Estimated cases of work-related injuries and illnesses Estimated cases of injuries and illnesses involving days away from work Estimated cases of injuries and illnesses involving more than 10 days away from work
Denominator:	Estimated total full-time equivalents (FTEs) worked for the same calendar year
Measures of Frequency:	Estimated annual total number of work-related injuries and illnesses (numerator) Estimated annual total work-related injury and illness incidence rate per 100,000 FTEs Estimated annual total number of cases involving days away from work (numerator) Estimated annual total incidence rate for cases involving days away from work per 100,000 FTEs Estimated annual total number of cases involving more than 10 days away from work (numerator)
Time Period:	Calendar year
Significance and Background:	In 2009, the US Bureau of Labor Statistics (BLS) reported an estimated total of 3.3 million injury and illness cases within the private sector workforce, an estimated incidence rate of 3.6 cases per 100 full-time-equivalent workers. This included a total of 1.1 million injury and illness cases (1.1 cases per 100 FTE workers) requiring recuperation away from work beyond the incident day.
Rationale:	Work-related injuries and illnesses are preventable, and control of occupational hazards is the most effective means of prevention. Estimating the burden and tracking these injuries can help target prevention programs and activities. Information on reported cases can be used to identify contributory factors and to develop improved or new prevention strategies or regulations to protect workers.
Limitations of Indicator:	Employers are required to record events that result in death, loss of consciousness, days away from work, restricted work, or medical treatment beyond first aid. They are only required to report the detailed case characteristics (e.g., nature, body part, event) when the injury or illness results in at least one day away from work. Employers do not always record all relevant events. Also, employers are often unaware of work-related conditions for which employees have obtained medical care from their personal health care providers, and conditions that have long latencies and are diagnosed long after an employee leaves their employment. With respect to injuries/illnesses involving days away from work, employers vary in their use of restricted work activity to reduce lost workdays among their employees with work-related conditions, thereby avoiding cases with days away from work.
Data Resources:	Annual BLS Survey of Occupational Injuries and Illnesses (SOII)
Limitations of Data Resources:	The SOII is a function of BLS using a probability sample and not a census of all employers. It is based on injury and illness data maintained by employers and is subject to sampling error. There is a potential for additional sampling error if an employer has more than 30 cases with days away from work as an employer is only required to report on 30 such cases. Excluded from the survey are the

	military, self-employed individuals, farms with fewer than 11 employees, and Federal agencies. In some states, the survey does not cover the state and municipal employees. Therefore, the recommended measures of frequency are limited to private sector workforce only. Some states do not participate in the Federal-State survey, and in some participating states, the sample sizes are insufficient to generate state-specific estimates. Numbers and rates may not be published/released by BLS due to the reliability of the estimates. Employers vary with respect to how much they may reduce their potential reporting burden by placing affected workers on restricted work activity, thereby avoiding the reporting of lost workday cases (which require reporting of additional details).
<mark>HP2020 Objective:</mark>	None
CSTE Positions:	None
Other Available Data:	Industry, occupation, age, gender, race/ethnicity, nature of injury, body part, type of event and source of injury, length of service. Public sector should be looked at, if available. (Details are available only for injuries/illnesses involving days away from work.)
Recommendations:	SOII has many data elements that can be used to better define patterns of work-related injuries and illnesses in the state. These include, for example, industry-specific counts and rates, and, for cases involving days away from work, counts (not rates) of illnesses and injuries by occupation, length of service, age, gender, race/ethnicity and sources of injury.

How-To Guide – Indicator #1:

NON-FATAL WORK RELATED INJURIES AND ILLNESSES REPORTED BY EMPLOYERS

Two methods to obtain the data are offered - both methods will yield the same numbers. The first method uses the Bureau of Labor Statistics (BLS) website to access the data. The second method uses a CD-ROM, provided by BLS, to access the data. Because the BLS CD-ROM is needed for some of the other indicators, states may elect to use the CD-ROM for this indicator as well. The CD-ROMs can be obtained annually from state SOII programs or BLS regional offices. State contact information is provided at http://www.bls.gov/iif/oshstate.htm

1.1 Estimated Annual Total Number of Work-Related Injuries and Illnesses
Method 1:
- Go to the BLS web site: http://www.bls.gov/iif/oshstate.htm
- Select your state from the map.
- Select "Case counts' under SOII for the specific year needed.
- From resulting Table 7, read across 'Private Industry' row and down major column 'Total Recordable Cases'
- Multiply this cell's value by 1,000 to get the **'Estimated annual total number of work-related injuries and illnesses'.**

Method 2:
- Use OSH Profile CD-ROM (CD-ROM is available from BLS).
- Insert the CD-ROM and install the profile program onto your computer following the prompts.
- Make sure the CD-ROM is inserted in the appropriate drive and double-click on your desktop shortcut 'OSH_Profiles'. If the dialog box appears, click on 'Enable Macros'. You will see a spreadsheet that says 'Bureau of Labor Statistics Survey of Occupational Injuries and Illnesses Profiles System' with a blue background.
- Click on 'Click here!!!'. Click 'OK' to confirm the CD-ROM is inserted in the appropriate drive. Click on 'CDs' button and select the drive for your CD-ROM. Then click 'OK'. Click 'OK' again.
- Select 'Annual Survey Summary Tables' from 'Publication Type' column.
- Select State and Year.
- Click on 'Create Profiles/Tables'.
- Select Table 7 - 'Counts of injuries and illnesses by industry'. Click 'OK'.
- Once automated data processing is complete, click 'Close', then click 'Yes' to exit system, and then 'OK'.
- From resulting table, read across 'Private Industry' row and down major column 'Total Recordable Cases.'
- Multiply the value of this cell by 1,000 to get the **'Estimated annual total number of work-related injuries and illnesses'** for your state.
- Click on the 'X' sign on the top of the right hand side of the spreadsheet to close it. Click 'NO' to saving changes.

1.2 Estimated Annual Total Work-Related Injury and Illness Incidence Rate per 100,000 FTEs

Method 1:
- Go to the BLS web site: http://www.bls.gov/iif/oshstate.htm
- Select your state from the map.
- Select 'Incidence Rates' under SOII for the specific year needed.
- From resulting Table 6, read across 'Private Industry' row and down major column 'Total Recordable Cases.' (rate is provided per 100 FTEs).
- Multiply the value of this cell by 1,000 to get the **'Estimated annual total work-related injury and illness incidence rate per 100,000 FTEs'.**

Method 2:
- Use OSH Profile CD-ROM (CD-ROM is available from BLS).
- Insert the CD-ROM and double-click on your desktop shortcut 'OSH_Profiles'. If the dialog box appears, click on 'Enable Macros'. You will see a spreadsheet that says 'Bureau of Labor Statistics Survey of Occupational Injuries and Illnesses Profiles System' with a blue background.
- Click on 'Click here!!!'. Click 'OK' to confirm the CD-ROM is inserted in the appropriate drive. Click on 'CDs' button and select the drive for your CD-ROM. Then click 'OK'. Click 'OK' again.
- Select 'Annual Survey Summary Tables' from 'Publication Type' column.
- Select State and Year.
- Click on 'Create Profiles/Tables'.
- Select Table 6 - 'Incidence rates of injuries and illnesses by industry'. Click 'OK'.
- Once automated data processing is complete, click 'Close', then click 'Yes' to exit system, and then 'OK'.
- From resulting table, read across 'Private Industry' row and down major column 'Total Recordable Cases' (rate is provided per 100 FTEs).
- Multiply the value of this cell by 1,000 to get the **'Estimated annual total work-related injury and illness incidence rate per 100,000 FTEs'.**
- Click on the 'X' sign on the top of the right hand side of the spreadsheet to close it. Click 'NO' to saving changes.

1.3 Estimated Annual Total Number of Cases Involving Days Away from Work
Method 1:
- Go to the BLS web site: http://www.bls.gov/iif/oshstate.htm
- Select your state from the map.
- Select "Case counts' under SOII for the specific year needed.
- From resulting Table 7, read across 'Private Industry' row and down <u>major</u> column 'Cases with days away from work, job transfer, or restriction.' Identify sub-column 'Cases with days away from work.'
- Multiply the value of this cell by 1,000 to get the **'Estimated annual total number of cases involving days away from work'.**

Method 2:
- Use OSH Profile CD-ROM (CD-ROM is available from BLS).
- Insert the CD-ROM and double-click on your desktop shortcut 'OSH_Profiles'. If the dialog box appears, click on 'Enable Macros'. You will see a spreadsheet that says 'Bureau of Labor Statistics Survey of Occupational Injuries and Illnesses Profiles System' with a blue background.
- Click on 'Click here!!!'. Click 'OK' to confirm the CD-ROM is inserted in the appropriate drive. Click on 'CDs' button and select the drive for your CD-ROM. Then click 'OK'. Click 'OK' again.
- Select 'Annual Survey Summary Tables' from 'Publication Type' column.
- Select State and Year.
- Click on 'Create Profiles/Tables'.
- Select Table 7 - 'Counts of injuries and illnesses by industry'. Click 'OK'
- Once automated data processing is complete, click 'Close', then click 'Yes' to exit system, and then 'OK'.
- From resulting table, read across 'Private Industry' row and down <u>major</u> column 'Cases with days away from work, job transfer, or restriction.' Identify sub-column 'Cases with days away from work.'
- Multiply the value of this cell by 1,000 to get the **'Estimated annual total number of cases involving days away from work'.**
- Click on the 'X' sign on the top of the right hand side of the spreadsheet to close it. Click 'NO' to saving changes.

1.4 <u>Estimated Annual Total Incidence Rate for Cases Involving Days Away from Work per 100,000 FTEs</u>
Method 1:
- Go to the BLS web site: http://www.bls.gov/iif/oshstate.htm
- Select your state from the map.
- Select 'Incidence Rates' under SOII for the specific year needed.
- From resulting Table 6, read across 'Private Industry' row and down <u>major</u> column 'Cases with days away from work, job transfer, or restriction.' Identify sub-column 'Cases with days away from work' (rate is provided per 100 FTEs).
- Multiply the value of this cell by 1,000 to get the **'Estimated annual total incidence rate for cases involving days away from work per 100,000 FTEs'.**

Method 2:
- Use OSH Profile CD-ROM (CD-ROM is available from BLS).
- Insert the CD-ROM and double-click on your desktop shortcut 'OSH_Profiles'. If the dialog box appears, click on 'Enable Macros'. You will see a spreadsheet that says 'Bureau of Labor Statistics Survey of Occupational Injuries and Illnesses Profiles System' with a blue background.
- Click on 'Click here!!!'. Click 'OK' to confirm the CD-ROM is inserted in the appropriate drive. Click on 'CDs' button and select the drive for your CD-ROM. Then click 'OK'. Click 'OK' again.
- Select 'Annual Survey Summary Tables' from 'Publication Type' column.

- Select State and Year.
- Click on 'Create Profiles/Tables'.
- Select Table 6 - 'Incidence rates of injuries and illnesses by industry'. Click 'OK'
- Once automated data processing is complete, click 'Close', then click 'Yes' to exit system, and then 'OK'.
- From resulting table, read across 'Private Industry' row and down <u>major</u> column 'Cases with days away from work, job transfer, or restriction.' Identify sub-column 'Cases with days away from work' (rate is provided per 100 FTEs).
- Multiply the value of this cell by 1,000 to get the **'Estimated annual total incidence rate for cases involving days away from work per 100,000 FTEs'**.
- Click on the 'X' sign on the top of the right hand side of the spreadsheet to close it. Click 'NO' to saving changes.

1.5 <u>Estimated Annual Total Number of Cases Involving more than 10 Days Away from Work</u>
- Use OSH Profile CD-ROM (CD-ROM is available from BLS).
- Insert the CD-ROM and double-click on your desktop shortcut 'OSH_Profiles'. If the dialog box appears, click on 'Enable Macros'. You will see a spreadsheet that says 'Bureau of Labor Statistics Survey of Occupational Injuries and Illnesses Profiles System' with a blue background.
- Click on 'Click here!!!'. Click 'OK' to confirm the CD-ROM is inserted in the appropriate drive. Click on 'CDs' button and select the drive for your CD-ROM. Then click 'OK'. Click 'OK' again.
- Select 'Case and Demo Numbers (Table1)' from 'Profile Type' column.
- Select State and Year.
- Select 'NAICS' from 'Characteristic Type'
- Select 'Private Industry' from 'Ownership'
- Select '000000 Total' from 'Characteristic Code' (includes all industries).
- Click on 'Create Profiles/Tables'.
- Once automatic data processing is complete, click 'Close', then click 'Yes' to exit system, and then 'OK'.
- On page 2 in the resulting table, under 'Number of days away from work', *highlight* the following three cells under the Private Industry column: '11 to 20 days', 21 to 30 days, and 31 or more days.
- On the right side of your screen (at the bottom), Excel will have summed the counts in these cells, 'Sum = xx,xxx'.
- Write down this sum, which is the '**Estimated annual total number of cases involving more than 10 days away from work'**.
- Click on the 'X' sign on the top of the right hand side of the spreadsheet to close it. Click 'NO' to saving changes.

Data Tips: Regional BLS offices can provide revised/updated counts and rates for any year. Numbers and rates may not be available from the CD-ROM or website if the estimate does not meet the publishable criteria of BLS. This is particularly true for small states and rare conditions.

TOPIC:	**OCCUPATIONAL INJURIES AND ILLNESSES COMBINED**

INDICATOR #2: WORK-RELATED HOSPITALIZATIONS

Demographic Group:	Employed persons
Numerator	Inpatient hospital discharges with primary payer coded as workers' compensation
Denominator:	Employed persons age 16 years or older for the same calendar year
Measures of Frequency:	Annual number of inpatient hospitalizations for persons age 16 years or older (numerator) Annual crude rate of inpatient hospitalizations per 100,000 employed persons age 16 years or older
Time Period:	Calendar year
Significance and Background:	In 2009, there were 3.3 million work-related injuries and illnesses reported in private industry of which 1.8 million cases involved days away from work. Workers' compensation costs in the United States total more than $100 billion per year.
Rationale:	Individuals hospitalized with work-related injuries and illnesses have some of the most serious and costly work-related adverse health outcomes. Tracking of these significant adverse health effects should be undertaken to document the burden of occupational injuries and illnesses, to design, target, and evaluate the impact of prevention efforts over time, and to identify previously recognized settings in which workers may continue to be at high risk.
Limitations of Indicator:	Inpatient hospital discharge records are only available for non-federal, acute care hospitals. Individuals hospitalized for work-related injuries and illnesses represent less than 10 percent of all workers who receive workers' compensation. The majority of individuals with work-related illnesses and many others with injuries do not file for workers' compensation. Additionally, self-employed individuals such as farmers and independent contractors, federal employees, railroad or longshore and maritime workers are not covered by state workers' compensation systems. Attribution of payer in hospital discharge may not be accurate. Data between states may not be comparable due to the differences in states' workers' compensation programs.
Data Resources:	Inpatient hospital discharge data (numerator) BLS Current Population Survey Data (denominator)
Limitations of Data Resources:	Practice patterns and payment mechanisms may affect decisions by health care providers to hospitalize patients, to correctly diagnose work-related conditions, and/or to list the condition as a discharge diagnosis. Residents of one state may be hospitalized in another state and not be reflected in his/her state's hospitalization data. All admissions are counted, including multiple admissions for a single individual. Until hospital discharge data is available in all states, aggregation of state data to produce nationwide estimates will be incomplete. Data on race/ethnicity is not collected in some states and is incomplete and/or questionable validity in others.
HP2020 Objectives:	OHS-2
CSTE Positions:	None
Other Available Data:	Age, gender, race/ethnicity, diagnosis, residence zip code
Recommendations:	Age, gender, race/ethnicity, zip code specific counts and rates can be used to better define the pattern of work-related hospitalizations. Proportion of all hospitalizations in the state can be examined.

2.1 Annual numberof inpatient hospitalizations for persons age 16 years or older

Obtain from the State Health Department the number of cases meeting the following criteria from the inpatient hospital discharge file:

- Primary payer = Workers' Compensation.
- Limit age to those 16 years or older.
- Select for state of residence = *'your state'*.
- Exclude:
  - age unknown
  - out-of-state residents and unknown residence
  - out-of-state inpatient hospitalizations
- Use undeduplicated data (no exclusions for deaths, readmissions).
- Use discharge data during calendar year, not fiscal year.
- Use all cases reported on the discharge file, regardless of length of stay.
- This will yield **'Annual numberof inpatient hospitalizations for persons age 16 years or older'**.

2.2 Annual crude rate of inpatient hospitalization per 100,000 employed persons age 16 years or older

a) To obtain the denominator for the rate:

- Go to http://www.bls.gov/gps/#tables to access the Geographic Profile of Employment and Unemployment (GPS) which contains Current Population Survey estimates for state-specific numbers of employed persons.
- Page down to heading "TABLES CREATED BY BLS".
- Find table for "Employment status of the civilian noninstitutional population in states by sex, race, Hispanic or Latino ethnicity, marital status, and detailed age "Note: Data from 1997 through 2002 can be found at http://www.bls.gov/opub/gp/laugp.htm.
- Choose the Annual Averages for year of Interest.
- Scroll down to find your state.
- Read the 'Total' row for your state and the 4th data column- 'Employment Number'. This is the **'Number of employed persons age 16 years or older'** (in thousands). Multiple by 1000.

b) To calculate the rate:

- Divide the numerator (2.1) by the denominator (2.2a).
- Multiply this result by 100,000 to get the **'Annual crude rate of inpatient hospitalizations per 100,000 employed persons age 16 years or older'**.

Topic:	ACUTE AND CUMULATIVE OCCUPATIONAL INJURIES
INDICATOR #3: FATAL WORK-RELATED INJURIES	
Demographic Group:	Employed persons
Numerator:	All fatal work-related injuries reported to the Census of Fatal Occupational Injuries (CFOI)
Denominator:	Total hours worked by all employees
Measures of Frequency:	Annual number of fatal work-related injuries (numerator) Annual crude fatality rate per 100,000 full-time equivalent workers (FTEs) age 16 years or older
Time Period:	Calendar year
Significance and Background:	Each year, over 5,000 cases of work-related fatalities are reported to the Census of Fatal Occupational Injuries (CFOI) Program administered by the Bureau of Labor Statistics (BLS). On an average day, 14 workers die as a result of injuries sustained at work. Worker fatalities have decreased approximately 16% from a decade earlier.
Rationale:	Multiple factors and risks contribute to work-related fatalities, including workplace/process design, work organization, worker characteristics, economics and other social factors. Surveillance of work-related fatalities can identify new hazards and case clusters, leading to the development of new interventions and development of new or revised regulations to protect workers.
Limitations of Indicator:	Fatalities of people younger than 16 may be included in the numerator but are not included in the denominator, since employment statistics are only available for those 16 years of age and older. Because the numbers of deaths among those less than 16 in any one state are small, these numbers are not broken out in the BLS tables and often do not meet the BLS publication criteria. Also CFOI reports data on work-related fatalities by the state in which the fatal incident occurred, which is not necessarily the state of death or the state of residence. The denominator data used for calculating rates is based on state of residence, thus rates may overestimate risk for a state if the fatal incidents involved victims who were out of state residents. Likewise, rates may be underestimated if fatal incidents occurred in other states. Deaths in the military are included in the counts but not the rates.
Data Resources:	Census of Fatal Occupational Injuries (numerator) BLS Current Population Survey Data (denominator)
Limitations of Data Resources:	CFOI program states are not permitted to release occupation or industry specific data when data are sparse. Such sparse data is categorized under 'others'. The CFOI program, although it has a data element for ICD codes, publishes findings according to the OIIC classification system rather than ICD. Therefore, data from CFOI may not be comparable to causes of death documented on death certificates.
HP2020 Objectives:	OSH-1 and OSH-5
CSTE Positions:	None
Other Available Data	Industry and occupation, age, gender, race/ethnicity, nature, source of injury and event

NOTE: The denominator that the Bureau of Labor Statistics (BLS) uses to calculate fatality rates has changed over time from the number employed to hours worked. The new hours-based rates use the average number of employees at work and the average hours each employee works. To be consistent with the BLS, the denominator for fatal work-related injury rates for this indicator has changed from the number employed, as indicated in the Geographic Profiles, to the number of hours worked. States may wish to calculate rates using either method to track trends over time.

3.1 Annual number of fatal work-related injuries
- Go to the BLS web site: http://www.bls.gov/iif/home.htm.
- Scroll down to "Regional Resources" on the right hand side of the page.
- Select your state and click 'Go'.
- Under CFOI, select 'Profile of Occupational Fatalities' file for the appropriate year.
- From resulting table (table 1), read across 'Total' row and down 'Total' column. This is the '**Annual number of fatal work-related injuries'.** A (p) notation next to the number denotes a preliminary count, subject to change at a later date. (See Data Tips).

This is the **'Annual number of work-related fatal injuries'** for your state.

3.2 Annual crude fatality rate per 100,000 Full-Time-Equivalent workers (FTEs) age 16 years or older.

a) To obtain the annual average number of Full-Time-Equivalent workers (FTEs) age 16 years or older (the denominator for the rate).

Method #1: for 2000-2009 Data
- Contact Erin Simms (esimms@cste.org) at CSTE to obtain 'Annual number of Full Time Equivalent Workers (FTEs).' These annual state estimates have been provided by NIOSH, DSR for the years 2000 through 2009.
- On the provided Excel workbook titled 'st_fte_2000-09.xlsx, choose 'your state' from the tabs at the bottom.
- Read the number in the FTE column from the same row as the year of interest. This is the **'Annual Average Number of Full Time Equivalent Workers (FTEs) age 16 years or older.'**

Method #2: Using Data Ferrett
- Go to http://dataferrett.census.gov.
  - DataFerrett is a US Census product described as a "data mining and extraction tool." Previously, users downloaded and operated the DataFerrett application from their personal computer. (These users can still use DataFerrett from their computer – if you are one of the users who in the past installed DataFerrett to your computer, please skip down five bullet points to "Previous & New Users" below.) New DataFerrett users will run the program from their internet browser.

New Users:

- On the homepage, you will find helpful information on DataFerrett on the right hand column, including a QuickTour, Tutorials, and a User's Guide. Click on the DataFerrett icon below "Get Data ~ Run".
- To initiate DataFerrett, click on "DataFerrett."
- Next install the DataFerrett Security Policy. Installing the Security Policy will allow you to ==cut, paste== and print your data. If ==you have problems== installing the policy, retry using "Continue without Security Policy."

Previous & New Users:

- Double click on the "DataFerret" Icon in the center of the page. ==(do not select "Beta" version).==
- Type your work e-mail address into the pop-up box and click OK.
- Click on "Step1: Select Dataset and Variable" at the top of the page.
- Within the "Select Dataset(s) to Search menu on the left hand side of the screen," click on the + sign for Current Population Survey. Then click on the + sign for Basic.
- Select the months of interest by highlighting them.
- Multiple months can be highlighted by clicking and simultaneously using the control key. (Alternatively: a range of months can quickly be selected by clicking on one month (e.g., January ==2009==), then clicking on another month (e.g., December ==2009==) while holding down the Shift key. All the months within the range should then be highlighted.) Use the right mouse key to display a drop down menu. Select "View Variables"
- Select the following topics: "Labor Force Variables", "Geography Variables", and "Weighting Variables" then select "Search Variables" at the bottom of that box.
- On the next screen all of the available variables for the selected topics will be displayed. Click on the heading "Name" to sort the variables alphabetically.
- Select the following variables and value ranges:
  o **GESTCEN** (Geography – census state code.) Click to open. Once the screen opens, at the top of the second panel, click the check box marked "Select."   Click "Deselect all values", on the right side of the screen. Check your State code, and then click on 'OK'. Click on 'OK' to confirm and to add the variable to your DataBasket.
  o **PEHRACT1** between 0 and 99 (Labor Force – # hours actually worked at main job). Click to open. Once the screen opens, at the top of the second panel, click the check box marked "Select." Two options will appear in the second panel. Deselect the "-1) Not in Universe," but leave the second option, "0-99 Range," checked as is (0-99 Range) and then click on 'OK'. Click on 'OK' to confirm and to add the variable to your DataBasket.
  o **PEMLR** (Labor force – employment status.) Click to open. Once the screen opens, at the top of the second panel, click the check box marked "Select."   Click "Deselect all values", on the right side of the screen. Then check "Employed – At Work" and "Employed – Absent" then click OK. Click on 'OK' to confirm and to add the variable to your DataBasket.
  o **PWCMPWGT** (Weight – final composited weight). Double click to open. Notice that no values appear, although a description is provided for **PWCMPWGT**. Hit "**Select"** at the top of the second panel. Click on 'OK' again to confirm and to add the variable to your DataBasket.

- You will be brought back to the window with your variable list and monthly dataset selections. At the top of this page, click "Step 2: DataBasket/Download/Make a Table."
- Click on the "Make a Table" icon to access the Ferret Tabulation table.
  - A new window will open containing your variable list in the panel on the right and data option keys across the top. Be patient once you have clicked this button…it may take 10-20 seconds for the table application to appear.
- An Excel-type spreadsheet will appear on the screen. To the far right is your variable list. Click on **PEHRACT1**, and while holding your left mouse button down, drag the "Hand" to Column 1. R2 X C1 will have the tag "Total PEHRACT1" and there will be values of "0 Range" to "99 Range" in rows R3-R102. These represent age values.
- Go back to the variable list and drag the variable **Instances** (i.e., **PWCMPWGT**) to Column 2. The R1 X C2 will have the tag "Total Instances" placed in it, while R1 X C3 through R1 X C14 will have the month-year tags (e.g., Dec 2009 for R1 X C3). All other cells will have a "?" in them.
- In the upper left hand corner of the spreadsheet tool bar, locate the green shaded button "Go Get Data." Click on this button. In a few seconds the table will be populated with the number of persons employed in your state by the range of hours worked in primary job for the week prior to interview for the CPS.
  - The selections for the query are provided in simple SAS code on the right side of the screen. Verify that you have selected your state, hours worked in the primary job between 0 and 99 hours (PEHRACT1), "PEMLR=1" and "PEMLR=2" and the correct months of interest.
- Highlight the cells containing data in the spreadsheet.
- Select Copy from the Edit dropdown menu and paste the copied cells into an Excel file.
- You are now finished with Data Ferrett
- In the Excel Spreadsheet Column A is "Hours Worked Range", and Column B is the "Number Employed in Range". You are now ready to calculate the total FTE in your State using MS Excel. To do this you will need to delete the word "Range" from the numeric values in column A.
- You can do this in MS Excel, by using the 'Replace' function (labeled 'Find and Select' under the binoculars icon in the upper right-hand corner of Excel 2007 or typing the "Ctrl" and "F" button simultaneously).
- When the pop-up box appears, type the word "Range" into the 'Find What' box and leave the 'Replace With' box blank.
- Click on the 'Replace All' button. This will remove the word "Range" from the numeric values in column A.
  - Next you must determine the number of FTES in your state. To do this, insert a new column in column C of your spreadsheet.
  - Starting with the '0' hours row (row 3), paste the Excel equation into column C "=A3*(B3*52)/(12*2000)".
    - This equation multiplies the "hours worked" value in column A by the **instances** these were estimated to have occurred for all 12 monthly surveys provided in column B. Multiplying by 52 accounts for all weeks in a year. Dividing by 12 annualizes the 12 month total provided in column B, and dividing by 2000 converts the resulting annual average number of hours to an FTE.

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- Drag the equation down the length of the column by holding down the "+" in the lower right hand of the cell in which you entered the equation (C3). This will populate the remaining FTE values by the hour worked category.
- Sum all numbers in column C (C3:C102); this is the estimate of the **Annual Average Full-Time-Equivalent Workers (FTEs) age 16 years or older.**

b) To calculate the Annual Average Full-Time-Equivalent Workers (FTEs) age 16 years or older.
- Divide the 'Annual number of work-related fatal injuries' from 3.1 by the 'Number of employed persons 16 years of age or older' from 3.2a.
- Multiply the result by 100,000 to get the '**Annual crude fatality rate per 100,000 FTEs age 16 years and older'.**

NOTE: Because of data limitations, fatalities among persons less than 16 years of age may be included in the numerator (3.1) but are excluded from the denominator.

Data Tips
- CFOI publishes preliminary data approximately nine months after the close of the calendar year. A year later, CFOI publishes final, updated counts. The indicator should be based on the final counts. State contact information is provided at http://www.bls.gov/iif/oshstate.htm
- For data on fatal work-related injuries prior to 2003, go to: http://www.bls.gov/iif/osh_nwrl.htm#cfoi. Scroll down to "Prior year releases available online" and select the year of interest under the CFOI heading. Within the selected document, locate the table illustrating deaths by state.
- Numbers may not be available from the web-site if the estimate does not meet the publishable criteria of BLS. This is particularly true for small states.

Topic:	ACUTE AND CUMULATIVE OCCUPATIONAL INJURIES

INDICATOR #4:	WORK-RELATED AMPUTATIONS WITH DAYS AWAY FROM WORK REPORTED BY EMPLOYERS
Demographic Group:	Employed persons in the private sector
Numerator:	Estimated cases of work-related amputation with days away from work (OIIC nature code 031)
Denominator:	Estimated total full-time equivalents (FTEs) worked for the same calendar year
Measures of Frequency:	Estimated annual number of work-related amputation cases with days away from work (numerator) Estimated annual incidence rate of work-related amputation cases with days away from work per 100,000 FTEs
Time Period:	Calendar year
Significance and Background:	In 2009, approximately 5,930 private sector workers experienced a nonfatal work-related amputation that required days away from work. Seventy-six percent of these workers were male. About 95% of work-related amputations are to the fingers. Results of one study indicated that 22% of all employees who experienced finger amputations had to give up their original employment. These injuries may greatly affect a worker's job skills and reduce earnings.
Rationale:	Work-related amputations are a preventable serious injury, and control of occupational hazards is the most effective means of prevention. Estimating the burden and tracking these injuries can help target prevention programs and activities. Information on reported cases can be used to identify contributory factors and to develop improved or new prevention strategies or regulations to protect workers.
Limitations of Indicator:	Employers are required to record events that result in death, loss of consciousness, days away from work, restricted work, or medical treatment beyond first aid. They are only required to report the detailed nature of injury when the injury results in at least one day away from work. Employers do not always record all relevant events. Employers vary in their use of restricted work activity to reduce lost workdays among their employees with work-related conditions, thereby avoiding cases with days away from work.
Data Resources:	Annual Bureau of Labor Statistics (BLS) Survey of Occupational Injuries and Illnesses (SOII)
Limitations of Data Resources:	The SOII is a function of BLS using a probability sample and not a census of all employers. It is based on injury and illness data maintained by employers and is subject to sampling error. There is a potential for additional sampling error if an employer has more than 30 cases with days away from work as an employer is only required to report on 30 such cases. Excluded from the survey are the military, self-employed individuals, farms with fewer than 11 employees, and Federal agencies. In some states, the survey does not cover the state and municipal employees. Therefore, the recommended measures of frequency are limited to private sector workforce only. Some states do not participate in the Federal-State survey, and in some participating states, the sample sizes are insufficient to generate State-specific estimates. Numbers and rates may not be published/released by BLS due to the reliability of the estimates. Employers vary with respect to how much they may reduce their potential reporting burden by placing affected workers on restricted work activity, thereby avoiding the reporting of lost workday cases (which require reporting of additional details). In addition, the SOII only collects data for the incident year, and does not capture lost work-time that may carry over to a new calendar year. For example, a debilitating injury that occurs on the last day of the calendar year will have no lost work-time associated with it in the SOII.
HP2020 Objective:	OSH-2
CSTE Positions:	None
Other Available Data:	Industry, occupation, age, gender, race/ethnicity, body part, type of event and source of injury.

	(Details are available only for injuries/illnesses involving days away from work.)
Recommendations:	SOII has many data elements that can be used to better define patterns of work-related amputations in the state. These may include, for example, industry-specific counts and rates of injuries, and for cases involving days away from work, counts (not rates) by occupation, length of service, age, gender, race/ethnicity and sources of injury.

How-To Guide – Indicator #4:

WORK-RELATED AMPUTATIONS WITH DAYS AWAY FROM WORK REPORTED BY EMPLOYERS

Two methods to obtain the data are offered - both methods will yield the same numbers. The first method uses the Bureau of Labor Statistics (BLS) website to access the data. The second method uses a CD-ROM, provided by BLS, to access the data. Because the BLS CD-ROM is needed for some of the other indicators, states may elect to use the CD-ROM for this indicator as well. The CD-ROMs can be obtained annually from state SOII programs or BLS regional offices. State contact information is provided at http://www.bls.gov/iif/oshstate.htm

4.1 <u>Estimated Annual Number of Work-Related Amputations Involving Days Away from Work</u>

<u>Method 1:</u>
- Go to the BLS web site: http://data.bls.gov/GQT/servlet/InitialPage.
- Select 'Case and Demographic Numbers' as the table type. Click on 'Continue'.
- Select the year of interest. Click on 'Continue'.
- Select the state of interest. Click on 'Continue'.
- Select 'Nature of condition' under 'Characteristic Type'. Leave 'Name or description' selected. Click on 'Continue'.
- Select 'Amputations 031XXX' under 'Subcharacteristics'. Leave 'Private industry' selected. Click on 'Continue'. Then select the desired output format—HTML or Excel (for Excel, then select 'Open' from the pop-up box to view the file).
- Read across 1st row 'Total' and down 3rd column 'Amputations (code 031XXX)' from the resulting table. This is the '**Estimated annual number of work-related amputations involving days away from work**'.

<u>Method 2:</u>
- Use OSH Profile CD-ROM (CD-ROM is available from BLS).
- Insert the CD-ROM and install the profile program onto your computer following the prompts.
- Double-click on your desktop shortcut 'OSH_Profiles'. If the dialog box appears, click on 'Enable Macros'. You will see a spreadsheet that says 'Bureau of Labor Statistics Survey of Occupational Injuries and Illnesses Profiles System' with a blue background.
- Click on 'Click here!!!'. Click 'OK' to confirm the CD-ROM is inserted in the appropriate drive. Click on 'CDs' button and select the drive for your CD-ROM. Then click 'OK'. Again, click 'OK'.
- From the 'Profile Type' column, select 'Case and Demo Numbers (Table 1)'.
- Select State and Year.
- From 'Ownership' select 'Private Industry'.
- From 'Characteristic Type', select 'Nature'.
- From 'Characteristic Code', select nature code '031 Amputations'.
- Click on 'Create Profiles/Tables'.
- When tables are completed, click on 'Close', then click 'Yes' to exit system, and then 'OK'.

- Read across 1st row 'Total' and down 3rd column 'Amputations (Code 031)' from resulting table. This is the '**Estimated annual number of work-related amputations involving days away from work'.**
- Click on the 'X' sign on the top of the right hand side of the spreadsheet to close it. Click 'NO' to saving changes.

4.2 <u>Estimated Annual Incidence Rate of Amputations Involving Days Away from Work per 100,000 FTEs</u>

Method 1:
- Go to the BLS web site: http://data.bls.gov/GQT/servlet/InitialPage.
- Select 'Case and Demographic Incidence Rates' as the table type. Click on 'Continue'.
- Select the year of interest. Click on 'Continue'.
- Select the state of interest. Click on 'Continue'.
- Select 'Nature of condition' under 'Characteristic Type'. Leave 'Name or description' selected. Click on 'Continue'.
- Select 'Amputations 031XXX' under 'Subcharacteristics'. Leave 'Private industry' selected. Click on 'Continue'. Then select the desired output format—HTML or Excel (for Excel, then select 'Open' from the pop-up box to view the file).
- Read across 1st row 'Total' and down 3rd column 'Amputations (code 031XXX)' from the resulting table. This is the number of amputations per 10,000 FTEs. Multiply the value of this cell by 10 to get the '**Estimated annual incidence rate of work-related amputations involving days away from work per 100,000 FTEs**'.

Method 2:
- Use the OSH Profile CD-ROM (CD-ROM is available from BLS).
- Insert the CD-ROM and double-click on your desktop shortcut 'OSH_Profiles'. If the dialog box appears, click on 'Enable Macros'. You will see a spreadsheet that says 'Bureau of Labor Statistics Survey of Occupational Injuries and Illnesses Profiles System' with a blue background.
- Click on 'Click here!!!'. Click 'OK' to confirm the CD-ROM is inserted in the appropriate drive. Click on 'CDs' button and select the drive for your CD-ROM. Then click 'OK.' Again, click 'OK'.
- From the 'Profile Type' column**,** select 'Case and Demo Incidence Rates (Table 2)'.
- Select State and Year.
- From 'Characteristic Type', select 'Nature'.
- From 'Characteristic Code', select nature code '031 Amputations'.
- Click on 'Create Profiles/Tables'.
- When tables are completed, click on 'Close'**,** then click 'Yes' to exit system, and then 'OK'.
- Read across 1st row 'Total' and down 3rd column 'Amputations (Code 031)' from resulting table. This is the number of amputations per 10,000 FTEs. Multiply the value of this cell by 10 to get the '**Estimated annual incidence rate of work-related amputations involving days away from work per 100,000 FTEs'.**
- Click on the 'X' sign on the top of the right hand side of the spreadsheet to close it. Click 'NO' to saving changes.

Data Tips:

- Numbers and rates are not available on the CD-ROM when the estimates are not reliable and do not meet BLS publication criteria. BLS does not publish rates less than 0.05 per 10,000 full-time workers. Rates under 0.05 are not considered publishable in the case and demographics system.
- For some years, BLS lists the number of amputations <u>in hundreds</u>. For such years, the listed figure must be multiplied by 100 to generate the number of amputations. BLS does include a parenthetical note to this effect (i.e., "(in hundreds)") in the table heading.

Topic:	ACUTE AND CUMULATIVE OCCUPATIONAL INJURIES
INDICATOR #5:	**STATE WORKERS' COMPENSATION CLAIMS FOR AMPUTATIONS WITH LOST WORK-TIME**

Demographic Group:	Workers covered by state workers' compensation system
Numerator:	Amputation cases with lost work-time filed with state workers' compensation system
Denominator:	Estimated number of workers covered by state workers' compensation system for the same calendar year
Measures of Frequency:	Annual number of amputation cases with lost work-time filed with state workers' compensation Annual incidence rate of amputation cases with lost work-time filed with state workers' compensation per 100,000 workers covered by state workers' compensation system
Time Period:	Calendar year
Significance and Background:	It is estimated that between 16,000 and 21,000 workers each year experience a work-related amputation. About 90% of work-related amputations involve the fingers. Results of one study indicated that 22% of all employees who experienced finger amputations had to give up their original employment. These injuries may greatly affect a worker's job skills and reduce earnings.
Rationale:	Work-related amputations are preventable, and control of occupational hazards is the most effective means of prevention. Estimating the burden and tracking these injuries can help target prevention programs and activities. Information on reported cases can be used to identify contributory factors and to develop improved or new prevention strategies or regulations to protect workers.
Limitations of Indicator:	Differences in the availability of data (i.e., for lost time cases only versus all medical benefits cases) and eligibility criteria between states indicate that data for this condition should be used to evaluate trends within a state but not to make state-to-state comparisons.
Data Resources:	Workers' compensation system (numerator) National Academy of Social Insurance (NASI) estimate of workers covered by workers' compensation (denominator)
Limitations of Data Resources:	Workers' compensation data are not complete, as the majority of individuals with work-related illnesses and many with work-related injuries do not file for workers' compensation. Workers' compensation claims may be denied. Additionally, self-employed individuals such as farmers and independent contractors, federal employees, railroad or longshore and maritime workers may not be covered by state workers' compensation systems.
HP2020 Objective:	OSH-2
CSTE Positions:	None
Other Available Data:	Age, gender, occupation and industry, type of event and source of injury
Recommendations:	Age, gender, occupation, and industry-specific counts and rates can be used to better define the pattern of occupational injuries/illnesses. Frequency distributions by events and source of injury can highlight important causes.

HOW-TO GUIDE – INDICATOR #5:

STATE WORKERS COMPENSATION CLAIMS FOR AMPUTATIONS WITH LOST WORK-TIME

5.1 Annual Number of Amputation Cases with Lost Work-time Filed with State Workers' Compensation

Variability in the coding systems used by state workers' compensation (WC) systems precludes a universal method for identifying amputation injuries. Variables within state workers' compensation data systems may be incomplete and are often not subject to quality control. Collaboration with the workers' compensation database manager is essential for completion. Identify the terminology used within the state workers' compensation system for amputation cases with lost work-time; typically these are considered 'claims'. Ask the database manager what 'claims' are reported for data collection. Some state workers compensation agencies collect only the subset of 'claims' which are legally contested. **NOTE:** This is administrative data that changes over time. Therefore, these data should be collected at the same time each year. The following are tips for constructing the database for analysis:

- Identify cases by date of injury.
    - If date of injury is not available, use the date the claim was filed.
    - If a trend analysis is to be performed for state data, claim filing date is more appropriate to use than claim date of injury.
- Include only filed cases which result in lost workdays or 'time loss.'
- Identify the coding system used for state workers' compensation amputation cases. Common coding systems encountered by states include:
    – American National Standards Institute Z16.2 (ANSI Z16.2) – Nature of Injury Code = 100 'Amputation/Enucleation';
    – Occupational Injury and Illness Classification System (OIICS) – Nature of Injury Code = 031 'Amputation'; or
    – National Council on Compensation Insurance, Inc. (NCCI)/Workers' Compensation Insurers Organization– Nature of Injury Code = 02 'Amputation.
- Exclude claims that involve the following body parts/regions unlikely to be associated with an amputation: eye, back, chest, abdomen, and body systems (e.g., respiratory system).
- Include claimants of all ages and those with age unknown.
- Include out-of-state residents.
- Recognize and document state workers' compensation laws that may affect state-to-state comparisons.
    – Number of lost workdays for claim to be considered a 'time loss' claim.
    – Statute of limitations for work-related injury claim filing.
    – Criteria for reporting a claim to state workers' compensation data system.
    – Medical care delivery for work-related injury, e.g., physician choice by employee.
    – Industries/occupations excluded from mandatory workers' compensation coverage.
    – Inclusion or exclusion of claims from self-insured employers in WC data.
    – Exclusions by employer size (e.g., exemption of compulsory workers' compensation insurance coverage for small employers).
- This will yield the **'Annual number of amputation cases with lost work-time filed with state workers' compensation'**

5.2 <u>Annual Incidence Rate of Amputation Cases with Lost Work-time Filed with State Workers' Compensation per 100,000 Workers Covered by State Workers' Compensation System</u>

a) To obtain the denominator for the rate:

- Go to National Academy of Social Insurance website: http://www.nasi.org/research/workers-compensation
- Identify the report entitled: "Workers' Compensation: Benefits, Coverage, and Costs, <<**YEAR**>>"
- Click on pdf icon for report to download (must have Adobe Acrobat).
- Go to Table with a title similar to "Number of Workers Covered by Workers' Compensation and Total Covered Wages, by State, <<**YEARS**>>".
- Identify state and read column for 'Covered Workers (in thousands)' for year of interest. Multiply number by 1,000.

b) <u>To calculate the rate</u>

- Divide the numerator (5.1) by the denominator (5.2a).

Multiply the result by 100,000 to get the **'Annual incidence rate of amputation cases with lost work-time filed with state workers' compensation per 100,000 workers covered by state workers' compensation system'**

Topic:	ACUTE AND CUMULATIVE OCCUPATIONAL INJURIES

INDICATOR #6: HOSPITALIZATIONS FOR WORK-RELATED BURNS

Demographic Group:	Employed persons
Numerator:	Inpatient hospital discharges with primary diagnosis of burn injury (ICD-9-CM code 940-949) and with primary payer coded as workers' compensation.
Denominator:	Employed population 16 years or older for the same calendar year
Measures of Frequency:	Annual number of work-related burn inpatient hospitalizations for persons age 16 years and older (numerator) Annual rate of work-related burn inpatient hospitalizations per 100,000 employed persons age 16 years or older
Time Period:	Calendar year
Significance and Background:	NIOSH has estimated that there are 150,000 work-related burns treated in the emergency rooms each year in the U.S. An estimated 30-40 percent of burns are work-related, with a peak incidence among younger workers, and with males affected more frequently than females. According to data from New England Regional Burn Program, 55 percent of all burns among adults are work-related.
Rationale:	Work-related burns are some of the most devastating injuries affecting workers. Although hospitalized burns are unusual events, they are painful, disabling, and expensive to treat. Many result in significant disfigurement. In addition, burns are the most common cause of work-related hospitalization for young workers.
Limitations of Indicator:	Individuals hospitalized for work-related injuries and illnesses represent less than 10 percent of all workers who receive workers' compensation. The majority of individuals with work-related illnesses and many others with injuries do not file for workers' compensation. Additionally, self-employed individuals such as farmers and independent contractors, federal employees, railroad or longshore and maritime workers are not covered by state workers' compensation systems. Attribution of payer in hospital discharge may not be accurate. Data between states may not be comparable due to differences in states' workers' compensation programs.
Data Resources:	Inpatient hospital discharge data (numerator) Bureau of Labor Statistics (BLS) Current Population Survey Data (denominator)
Limitation of Data Resources	Work-related burn injuries are experienced by employed individuals less than 16 years old, but corresponding denominator data is not readily available. Practice patterns and payment mechanisms may affect decisions by health care providers to hospitalize patients. Residents of one state may be hospitalized in another state and not be reflected in his/her state's hospitalization data. Until hospital discharge data is available in all states, aggregation of state data to produce nationwide estimates will be incomplete. Data on race/ethnicity is not collected in some states and is incomplete and/or of questionable validity in others. Hospital Discharge records are only available for non-federal, acute care hospitals.
HP2020 Objectives:	OSH-2
CSTE Positions:	None
Other Available Data:	Age, gender, race/ethnicity, and residence zip code
Recommendations:	Age, gender, race/ethnicity, and zip code specific counts and rates can be used to better define the pattern of burns. Can also look at proportion of all burn hospitalizations in the state.

How-To Guide – Indicator #6:

Hospitalizations for Work-related Burns

6.1 <u>Annual number of inpatient hospitalizations for work-related burns for persons age 16 years or older</u>
Obtain from State Health Department the following information from the inpatient hospital discharge file.
- Use principle diagnosis from 940 through 949 (ICD-9-CM).
- Use only primary payer = Workers' Compensation.
- Limit age to those 16 years and older.
- Select for state of residence = *'your state'*.
- Exclude:
  - age unknown
  - out-of-state residents and unknown residents
  - out-of-state inpatient hospitalizations.
- Use undeduplicated data (no exclusions for death, readmissions).
- Use discharge during calendar year, not fiscal year.
- Use all cases reported on the discharge file, regardless of length of stay.
- This will yield the **'Annual number of inpatient hospitalizations for work-related burns'**.

6.2 <u>Annual rate of inpatient hospitalizations per 100,000 employed persons age 16 years or older</u>
a) <u>To obtain the denominator for the rate:</u>
- Go to http://www.bls.gov/gps/#tables to access the Geographic Profile of Employment and Unemployment (GPS) which contains Current Population Survey estimates for state-specific numbers of employed persons.
- Page down to heading "TABLES CREATED BY BLS".
- Find table for "Employment status of the civilian noninstitutional population in states by sex, race, Hispanic or Latino ethnicity, marital status, and detailed age "Note: Data from 1997 through 2002 can be found at http://www.bls.gov/opub/gp/laugp.htm.
- Choose the Annual Averages for year of interest.
- Scroll down to find your state.
- Read the 'Total' row for your state and the 4th data column- 'Employment Number'. This is the **'Number of employed persons age 16 years or older'** (in thousands). Multiple by 1000.

b) <u>To calculate the rate:</u>
- Divide the numerator (2.1) by the denominator (2.2a).
- Multiply this result by 100,000 to get the **'Annual crude rate of work-related burn inpatient hospitalizations per 100,000 employed persons age 16 years or older'**.

Topic:	ACUTE AND CUMULATIVE OCCUPATIONAL INJURIES
INDICATOR # 7:	**WORK-RELATED MUSCULOSKELETAL DISORDERS WITH DAYS AWAY FROM WORK REPORTED BY EMPLOYERS**
Demographic Group:	Employed persons in the private sector
Numerator:	1. Estimated cases of all musculoskeletal disorders (MSDs) involving days away from work 2. Estimated cases of MSDs of the upper extremities, neck, and shoulder involving days away from work 3. Estimated cases of carpal tunnel syndrome involving days away from work 4. Estimated cases of MSDs of the back involving days away from work
Denominator:	Estimated full-time equivalents (FTEs) worked for the same calendar year
Measures of Frequency:	Estimated annual number of incident cases Estimated annual incidence rate per 100,000 full-time-equivalents
Time Period:	Calendar year
Significance and Background:	The 2003 Annual BLS Survey identified 435,180 cases of musculoskeletal disorders that resulted in days away from work which accounted for one-third of all lost workday cases reported. Close to one-half (49%) of these MSD cases involved the back. Estimates of the costs of back injuries alone are $50-100 billion per year. About 5% (22,110), of these cases were carpal tunnel syndrome. Twenty-nine percent (125,050) involved the neck, shoulder, or the upper extremities.
Rationale:	Work-related musculoskeletal disorders are preventable and control of occupational hazards is the most effective means of prevention. Estimating the burden and tracking these injuries helps target prevention programs and activities. Information on reported cases can be used to identify contributory factors and develop improved or new prevention strategies or regulations to protect workers.
Limitations of Indicator:	Employers are required to record events that result in death, loss of consciousness, days away from work, restricted work, or medical treatment beyond first aid. They are only required to report the detailed case characteristics (e.g., nature, body part, event) when the injury or illness results in at least one day away from work. Employers do not always record all relevant events. Also, employers are often unaware of work-related conditions for which employees have obtained medical care from their personal healthcare providers, and conditions that have long latencies and are diagnosed long after an employee leaves their employment. Regarding injuries/illnesses involving days away from work, employers vary in their use of restricted work activity to reduce lost work-days among their employees with work-related conditions, thereby avoiding cases with days away from work.
Data Resources:	Annual Bureau of Labor Statistics (BLS) Survey of Occupational Injuries and Illnesses (SOII)
Limitations of Data Resources:	The SOII is a function of BLS using a probability sample and not a census of all employers. It is based on injury and illness data maintained by employers and is subject to sampling error. There is a potential for additional sampling error if an employer has more than 30 cases with days away from work as an employer is only required to report on 30 such cases. Excluded from the survey are the military, self-employed individuals, farms with fewer than 11 employees, and Federal agencies. In some states, the survey does not cover the state and municipal employees. Therefore, the recommended measures of frequency are limited to private sector workforce only. Some states do not participate in the Federal-State survey, and in some participating states, the sample sizes are insufficient to generate State-specific estimates. Numbers and rates may not be published/released by BLS due to the reliability of the estimates. Employers vary with respect to how much they may reduce their potential reporting burden by placing affected workers on restricted work activity, thereby avoiding the reporting of lost workday cases (which require reporting of additional details). In addition, the SOII only collects data for the incident year, and does not capture lost work-time that may carry over to a new calendar year. For example, a debilitating injury that occurs on the last day of the calendar year will have no lost work-time associated with it in the SOII.
HP2020 Objectives:	OSH-3
CSTE Positions:	None

Other Available Data:	Age, gender, race/ethnicity, occupation, industry, type of event, and source of injury (Details are available only for injuries/illnesses involving days away from work.)
Recommendations:	States can examine work-related MSDs by industry (counts and rates) and by age, gender, race/ethnicity, occupation, and source of injury/illness (counts only).

How-To Guide – Indicator #7:

WORK-RELATED MUSCULOSKELETAL DISORDERS WITH DAYS AWAY FROM WORK REPORTED BY EMPLOYERS

NOTE: The definition of musculoskeletal disorders involving days away from work used by BLS has changed over time. The earlier definition included all cases of overexertion and repetitive motion (OIIC event codes 220-239). The definition used here, which restricts to certain body parts but adds another event code, is the most recent. Indicator values are developed using the revised OSHA definition of Musculoskeletal Disorders.

Surveillance definition of musculoskeletal disorders using the revised OSHA definition:
All injuries and illnesses involving days away from work with:
      OIIC nature codes:
           021 (sprains, strains, tears) **or**
           0972 (back pain, hurt back) **or**
           0973 (soreness, pain, hurt, except the back) **or**
           1241 (carpal tunnel syndrome) **or**
           153 (hernia) **or**
           17* (musculoskeletal system and connective tissue diseases and disorders)
   AND
      OIIC event codes:
           211 (bending, climbing, crawling, reaching, twisting) **or**
           22 (overexertion) **or**
           23 (repetitive motion)
   *All nature codes that begin with 17

NOTE: Cases of Raynaud's phenomenon, tarsal tunnel syndrome, and herniated spinal discs are not included in this definition.

7.1 Estimated Annual Number of All Musculoskeletal Disorders Involving Days Away from Work

7.1a. To obtain the 2000 – 2009 data, do the following:
- Go to BLS website: http://www.bls.gov/iif/home.htm
- Scroll down the page to the following phrase: "You can download an electronic version of any article or table from the BLS FTP site" which can be found at the bottom of the IIF Databases section of the page. Alternatively, using the Ctrl+F function to bring up a search box can be used to find this phrase.
- Click on "BLS FTP site" which will bring you to ftp://ftp.bls.gov/pub/special.requests/ocwc/osh/
- This page contains a few annual data sets for each State. The dataset naming conventions are:
        xxyear_nature.pdf
        xxyear_pob.pdf

where "xx" is the State abbreviation. The two tables detail MSDs by nature or part of body.

- *There is an alternate way to get MSD numbers and incidence rates querying the BLS profiles on the Web. Please refer to 7.9 and 7.10 below.

7.1b   Refer to the Nature Table for your state and year.
- Read across the first row ('Private Industry' and 'All Natures') under the column 'Total Cases' to obtain the '**Annual number of all musculoskeletal disorders involving days away from work'**.

[NOTE: Beginning in 2003, Nature and Body Part Tables displayed MSD cases by ownership (private industry, local government, state government) in states where the BLS SOII covers state and municipal employees as well as private industry employees. This indicator is limited to private industry employees.]

7.2 <u>Estimated Annual Incidence Rate of All Musculoskeletal Disorders Involving Days Away from Work per 100,000 FTE</u>
7.2a   From the Nature Table, read across the first row ('Private Industry' and 'All Natures') – under the column - 'Incidence Rate'.
7.2b   Multiply by 10 to obtain the "**Estimated annual incidence rate of all musculoskeletal disorders involving days away from work per 100,000 FTE'**.

[NOTE: Beginning in 2003, Nature and Body Part Tables displayed MSD cases by ownership (private industry, local government, state government) in states where the BLS SOII covers state and municipal employees as well as private industry employees. This indicator is limited to private industry employees.]

7.3 <u>Estimated Annual Number of Musculoskeletal Disorders of the Neck, Shoulder, and Upper Extremities Involving Days Away from Work</u>
7.3a   Follow directions for 7.1a.
7.3b   Refer to the Part of Body Table for your state and year.
- Sum the 'Total Cases' for the following three 'Private Industry' rows: '1 - Neck, including throat,' '21 – Shoulder, including clavicle, scapula' and '3 – Upper extremities', to obtain the **'Estimated annual number of musculoskeletal disorders of the neck, shoulder and upper extremities involving days away from work'.**

[NOTE: Beginning in 2003, Nature and Body Part Tables displayed MSD cases by ownership (private industry, local government, state government) in states where the BLS SOII covers state and municipal employees as well as private industry employees. This indicator is limited to private industry employees.]

7.4 <u>Estimated Annual Incidence Rate of Musculoskeletal Disorders of Neck, Shoulder, and Upper Extremities Involving Days Away from Work per 100,000 FTE</u>

7.4a   From the Part of Body Table, **sum** the 'Incidence Rates' for the following three 'Private Industry' rows: '1 - Neck, including throat,' '21 - Shoulder including clavicle, scapula' and '3 - Upper Extremities'.
7.4b   Multiply the sum by 10 to obtain the **'Annual incidence rate of musculoskeletal disorders of the neck, shoulder and upper extremities involving days away from work per 100,000 FTE'**.

[NOTE: Beginning in 2003, Nature and Body Part Tables displayed MSD cases by ownership (private industry, local government, state government) in states where the BLS SOII covers state and municipal employees as well as private industry employees. This indicator is limited to private industry employees.]

7.5 Estimated Annual Number of Carpal Tunnel Syndrome Cases Involving Days Away from Work
7.5a   Follow directions for 7.1a.
7.5b   From the Nature Table, read across the 'Private Industry' row, '1241 - Carpal Tunnel Syndrome', under the column - 'Total Cases' to obtain the **'Estimated annual number of carpal tunnel syndrome cases involving days away from work'**.

7.6 Estimated Annual Incidence Rate of Carpal Tunnel Syndrome Cases Involving Days Away from Work per 100,000 FTE
7.6a   From the Nature Table, read across the 'Private Industry' row, '1241 - Carpal Tunnel Syndrome', under the column - 'Incidence Rate.'
7.6b   Multiply the number by 10 to get the **'Estimated annual incidence rate of carpal tunnel syndrome cases involving days away from work per 100,000 FTE'.**

7.7 Estimated Annual Number of Musculoskeletal Disorders of the Back Involving Days Away from Work
7.7a   Follow directions for 7.1a.
7.7b   From the Part of Body Table, read across the 'Private Industry' row, '23 Back, including spine, spinal cord', under the column - 'Total Cases' to obtain the **'Estimated annual number of musculoskeletal disorders of the back involving days away from work'.**

7.8 Estimated Annual Incidence Rate of Musculoskeletal Disorders of the Back Involving Days Away from Work per 100,000 FTE

7.8a   From the Part of Body Table, read across the 'Private Sector' row '23 Back, including spine, spinal cord' under the column - 'Incidence rate.'
7.8b   Multiply the number by 10 to get the **'Estimated annual incidence rate of musculoskeletal disorders of the back involving days away from work per 100,000 FTE.'**

7.9 ALTERNATIVE METHOD for Estimating Annual Number of All Musculoskeletal Disorders Involving Days Away from Work ** FOR 7.1, 7.3, 7.5, & 7.7 *

1) Go to BLS website www.bls.gov/iif/data.htm

2) Under row labeled "Non-fatal Cases Involving Days Away from Work (2003 forward)", *select the multi-screen option which is yellow.*

3) *Select your State and* select Next Form.

4) *Select 'Private Industry' and* select Next Form.

5) *Select 'Injury and Illness Cases' and* select Next Form.

6) *Select 'M Industry Division or Selected Characteristic by Special Combination' and* select Next Form.

7) Depressing the CTRL key, *select the following: '00X All Industry', 'NJX Nature (Carpal Tunnel Syndrome)', 'PCX Part (Neck)', 'PEX Part (Back)', 'PFX Part (Shoulder)', 'PGX Part (Total Upper).'* Select Next Form.

8) *Select 'MSDXXX Musculoskeletal Disorders.'* Select Next Form.

9) *Select Retrieve Data.*

10) Review the six tables displayed.

7.1 Estimated Annual Number of All Musculoskeletal Disorders Involving Days Away from Work – Read annual number from the *'00X All Industry'* table.

7.3 Estimated Annual Number of Musculoskeletal Disorders of the Neck, Shoulder, and Upper Extremities Involving Days Away from Work - Sum annual numbers from the following tables: *'PCX Part (Neck)', 'PFX Part (Shoulder)',* and *'PGX Part (Total Upper).*

7.5 Estimated Annual Number of Carpal Tunnel Syndrome Cases Involving Days Away from Work – Read annual number from the *'NJX Nature (Carpal Tunnel Syndrome)'* table.

7.7 Estimated Annual Number of Musculoskeletal Disorders of the Back Involving Days Away from Work – Read annual number from the '*PEX Part (Back)'* table.

7.10 ALTERNATIVE METHOD for Estimating Annual Incidence Rate of All Musculoskeletal Disorders Involving Days Away from Work per 100,000 FTE – ** FOR 7.2, 7.4, 7.6, & 7.8 *

1) Go to BLS website www.bls.gov/iif/data.htm

2) Under row labeled "Non-fatal Cases Involving Days Away from Work (2003 forward)", *select the multi-screen option which is yellow.*

3) *Select your State and* select Next Form.

4) *Select 'Private Industry' and* select Next Form.

5) *Select 'Injury and Illness Rate per 10,000 Workers' and* select next form.

6) *Select 'M Industry Division or Selected Characteristic by Special Combination' and* select Next Form.

7) Depressing the CTRL key, *select the following: '00X All Industry', 'NJX Nature (Carpal Tunnel Syndrome)', 'PCX Part (Neck)', 'PEX Part (Back)', 'PFX Part (Shoulder)', 'PGX Part (Total Upper).'* Select Next Form.

8) *Select 'MSDXXX Musculoskeletal Disorders.'* Select Next Form.

9) *Select Retrieve Data.*

10) Review the six tables displayed.

> **7.2** Estimated Annual Incidence Rate of All Musculoskeletal Disorders Involving Days Away from Work per 100,000 FTE – Read Rate from the ***'00X All Industry'*** table and multiply by 10 to obtain **the Estimated Annual Incidence Rate of All Musculoskeletal Disorders Involving Days Away from Work per 100,000 FTE**.

> **7.4** Estimated Annual Incidence Rate of Musculoskeletal Disorders of the Neck, Shoulder, and Upper Extremities Involving Days Away from Work per 100,000 FTE - Sum Rates from the 'PCX Part (Neck)', 'PFX Part (Shoulder)', and 'PGX Part (Total Upper) tables and multiply the resulting sum by 10 to obtain the *Estimated* **Annual Incidence Rate of Musculoskeletal Disorders of the Neck, Shoulder, and Upper Extremities Involving Days Away from Work per 100,000 FTE.**

> **7.6** Estimated Annual Incidence Rate of Carpal Tunnel Syndrome Cases Involving Days Away from Work per 100,000 FTE – Read Rate from the ***'NJX Nature (Carpal Tunnel Syndrome)'*** table and multiply by 10 to obtain the **Estimated Annual Incidence Rate of Carpal Tunnel Syndrome Cases Involving Days Away from Work per 100,000 FTE**.

> **7.8** Estimated Annual Incidence Rate of Musculoskeletal Disorders of the Back Involving Days Away from Work per 100,000 FTE – Read Rate from the ***'PEX Part (Back)' table*** and multiply by 10 to obtain the **Estimated Annual Incidence Rate of Musculoskeletal Disorders of the Back Involving Days Away from Work per 100,000 FTE**.

Topic:	ACUTE AND CUMULATIVE OCCUPATIONAL INJURIES
INDICATOR #8:	**STATE WORKERS' COMPENSATION CLAIMS FOR CARPAL TUNNEL SYNDROME WITH LOST WORK-TIME**

Demographic Group:	Workers covered by state workers' compensation
Numerator:	Carpal tunnel syndrome cases with lost work-time filed with state workers' compensation system
Denominator:	Estimated number of workers covered by state workers' compensation system for the same calendar year
Measures of Frequency:	Annual number of carpal tunnel syndrome cases with lost work-time filed with state workers' compensation Annual incidence rate of carpal tunnel syndrome cases with lost work-time filed with state workers' compensation per 100,000 workers covered by state workers' compensation system
Time Period:	Calendar year
Significance and Background:	The 2006 Bureau of Labor Statistics (BLS) Annual Survey identified 13,010 cases of carpal tunnel syndrome that resulted in days away from work. The median number of days away from work was 27. The BLS estimated annual case incidence rate for carpal tunnel syndrome is 1.4 per 10,000 FTE. Estimates from state workers' compensation systems suggest the BLS annual survey underestimates the incidence rate of carpal tunnel syndrome.
Rationale:	Carpal tunnel syndrome is preventable, and control of occupational hazards is the most effective means of prevention. Estimating the burden and tracking carpal tunnel syndrome can help target prevention programs and activities. Information on reported cases can be used to identify contributory factors and to develop improved or new prevention strategies or regulations to protect workers.
Limitations of Indicator:	Differences in the availability of data (i.e., for lost time cases only versus medical benefits cases) and eligibility criteria between states indicate that data for this condition should be used to evaluate trends within a state but not to make state-to-state comparisons.
Data Resources:	Workers' compensation system (numerator) National Academy of Social Insurance (NASI) estimate of workers covered by workers' compensation (denominator)
Limitations of Data Resources:	Workers' compensation data is not complete, as the majority of individuals with work-related illnesses and many with work-related injuries do not file for workers' compensation. Workers' compensation claims may be denied. Additionally, self-employed individuals such as farmers and independent contractors, federal employees, railroad or longshore and maritime workers are not covered by state workers' compensation systems. (The length of days away from work that is required before a case will be recorded in the workers' compensation system will vary by state.)
HP2020 Objectives:	OSH-3
CSTE Positions:	None
Other Available Data:	Age, gender, occupation and industry, type of event and source of injury
Recommendations:	Age, gender, occupation, and industry-specific counts and rates can be used to better define the pattern of occupational injuries/illnesses. Frequency distributions by events and source of injury can highlight important causes.

**STATE WORKERS COMPENSATION CLAIMS FOR CARPAL TUNNEL SYNDROME
WITH LOST WORK-TIME**

**8.1 Annual Number of Carpal Tunnel Syndrome Cases with Lost Work-time Filed with
State Workers' Compensation**

Variability in the coding systems used by state workers' compensation systems precludes a
universal method for identifying carpal tunnel syndrome cases. Variables within state workers'
compensation data systems may be incomplete and are often not subject to quality control.
Collaboration with the workers' compensation database manager is essential for completion.
Identify the terminology used within the state workers' compensation system for carpal tunnel
syndrome cases with lost work-time; typically these are considered 'claims.' Ask the database
manager what 'claims' are reported for data collection. Some state workers' compensation
agencies collect only the subset of 'claims' which are legally contested. **NOTE:** This is
administrative data that changes over time. Therefore, these data should be collected at the same
time each year to allow for valid trend analysis within the state. The following are tips for
constructing the database for analysis:

- Identify cases by date of injury.
  - If date of injury is not available, use date claim was filed.
  - If a trend analysis is to be performed for state data, claim filing date is more
    appropriate to use than claim date of injury.
- Include only cases which result in lost workdays or 'time loss.'
- Identify the coding system used for state workers' compensation carpal tunnel syndrome
  cases. Common coding systems encountered by states include:
  – American National Standards Institute Z16.2 (ANSI Z16.2) – Nature of Injury Code
    = 562 'Nerve Disorder' combined with Type of Injury Code = 12* 'Overexertion'
    and Body Part Code = 320 'Wrist';
  – Occupational Injury and Illness Classification System (OIICS) – Nature of Injury
    Code = 1241 'Carpal Tunnel Syndrome';
  – International Classification of Diseases – 9th Revision Clinical Modification – ICD-9-
    CM Codes = 354.0 'Carpal tunnel syndrome' and/or ICD-9-CPT code = 64721
    'Neuroplasty; median nerve at carpal tunnel'; or
  – National Council on Compensation Insurance, Inc. (NCCI)/Workers' Compensation
    Insurers Organization– Nature of Injury Code = 78 'Carpal Tunnel Syndrome'.
- Include claimants of all ages and those with age unknown.
- Include out-of-state residents.
- Recognize and document state workers' compensation laws that may affect state-to-state
  comparisons.
  – Number of lost workdays for claim to be considered a 'time loss' claim.
  – Statute of limitations for work-related disease claim filing.
  – Criteria for reporting a claim to state workers' compensation data system.
  – Medical care delivery for a work-related disease (e.g., physician choice by worker).
  – Industries poorly represented in state's workers' compensation data (e.g. agriculture).

- Inclusion or exclusion of claims from self-insured employers in WC database.
- Industries/occupations excluded from mandatory workers' compensation coverage.
- Exclusions by employer size (e.g. exemption of compulsory workers' compensation insurance coverage for small employers).
- This will yield the **'Annual number of carpal tunnel syndrome cases with lost work-time filed with state workers' compensation'.**

8.2 Annual Incidence Rate of Carpal Tunnel Syndrome Cases with Lost Work-time Filed with State Workers' Compensation per 100,000 Workers Covered by State Workers' Compensation System

a) To obtain the denominator for the rate:
- Go to National Academy of Social Insurance web site: http://www.nasi.org/research/workers-compensation
- Identify report entitled: "Workers' Compensation: Benefits, Coverage, and Costs, **<<YEAR>>**."
- Click on report pdf icon to download (must have Adobe Acrobat).
- Go to Table titled "Number of Workers Covered by Workers' Compensation and Total Covered Wages, by State, **<<YEARS>>**".
- Identify state and read column for 'Covered Workers (in thousands)' for year of interest. Multiply by 1,000.

b) To calculate the rate:
- Divide the numerator (8.1) by the denominator (8.2a)
- Multiply the result by 100,000 to get the **'Annual incidence rate of carpal tunnel syndrome cases with lost work-time filed with state workers' compensation per 100,000 workers covered by state workers' compensation system'.**

TOPIC:	OCCUPATIONAL ILLNESSES

INDICATOR #9: HOSPITALIZATIONS FROM OR WITH PNEUMOCONIOSIS

Demographic Group:	Resident persons age 15 years or older
Numerator:	1. Inpatient hospital discharges with a primary or contributing diagnosis of total pneumoconiosis (ICD-9-CM code 500 through 505). 2. Inpatient hospital discharges with a primary or contributing diagnosis of coal workers' pneumoconiosis (ICD-9-CM code 500). 3. Inpatient hospital discharges with a primary or contributing diagnosis of "asbestosis" (ICD-9-CM code 501). 4. Inpatient hospital discharges with a primary or contributing diagnosis of "silicosis" (ICD-9-CM code 502). 5. Inpatient hospital discharges with a primary or contributing diagnosis of other or unspecified pneumoconiosis (ICD-9-CM code 503 through 505).
Denominator:	Midyear resident population age 15 years or older for the same calendar year
Measures of Frequency:	Annual number of inpatient hospitalizations for persons age 15 years or older (numerator) Annual rate of inpatient hospitalizations per million residents Annual, age-standardized, rate of inpatient hospitalization (standardized by the direct method to the Year 2000 U.S. standard population)
Time Period:	Calendar year
Significance and Background:	Nearly all pneumoconioses are attributable to occupational exposures, and millions of workers are at risk. Common types include asbestosis, coal workers' pneumoconiosis, and silicosis. Complications of various pneumoconioses and other conditions associated with exposure to the same dusts that cause pneumoconiosis include respiratory infections (including tuberculosis); chronic bronchitis; emphysema; lung cancer; pleuritis; progressive systematic sclerosis; renal disease; and respiratory failure.
Rationale:	Pneumoconiosis frequency varies geographically being largely determined by local industrial activities and migration of affected individuals. Control of occupational dust exposure is the single most effective means of preventing pneumoconiosis. Tracking of pneumoconiosis is essential for measuring progress towards elimination of the disease, as well as for targeting prevention and disease management programs.
Limitations of Indicator:	Because pneumoconioses are typically diseases of long latency, current incidence is not necessarily indicative of current exposure, and it may be many years before reductions in occupational exposures affect the number of hospitalizations.
Data Resources:	Inpatient hospital discharge data (numerator) State population estimates from the Bureau of the Census (denominator) Year 2000 U.S. Standard population (for age-standardization)
Limitation of Data Resources:	The number of diagnoses listed on discharge summaries may vary by regional practice patterns and by the persons completing the summaries. Practice patterns and payment mechanisms may affect decisions by health care providers to hospitalize patients, to diagnose pneumoconiosis, and/or to list pneumoconiosis as a discharge diagnosis. Residents of one state may be hospitalized in another state and not be reflected in his/her state's inpatient hospitalization data. Until inpatient hospital discharge data is available in all states, aggregation of state data to produce nationwide estimates will be incomplete.
HP2020 Objectives:	OSH-4
CSTE Positions:	1996-Env-02; 1999-ENV-04
Other Available Data:	Age, gender, race/ethnicity, residence zip code, payer code
Recommendations:	Age, gender, race/ethnicity, and zip code-specific counts and rates can be used to better define the pattern of hospitalizations. Information on the payer can be used to provide insight on utilization of workers compensation benefits.

HOSPITALIZATIONS FROM OR WITH PNEUMOCONIOSIS

9.1 Inpatient hospital discharges with a primary or contributing diagnosis of ICD-9-CM code
   500-505 ("total pneumoconiosis")
   9.1.1 Annual number of inpatient hospital discharges
   Obtain from the State Health Department the number of cases meeting the following
   criteria from the inpatient hospital discharge file:
   - Any diagnosis between 500 and 505 (ICD-9-CM).
   - Limit age to those 15 years and older.
   - Select for state of residence='*your state'*.
   - Exclude:
      - age unknown
      - out-of-state residents
      - unknown state of residence
      - out-of-state inpatient hospitalizations
   - Use undeduplicated data (no exclusions for deaths, readmissions).
   - Use discharge during calendar year, not fiscal year.
   - For each of these categories, obtain the number of inpatient hospitalizations for each of the
     following age groups: 15-24, 25-34, 35-44, 45-54, 55-64, 65-74, 75-84, 85 and over.
   - This will yield the **'Annual number of total pneumoconiosis inpatient hospitalizations for
     persons age 15 years of age and older'.**

   NOTE: If less than 5 events, the number may be too small to produce reliable estimates or
   may violate confidentiality requirements. Rates should not be calculated.

   9.1.2 Annual rate of inpatient hospitalization per million residents
a) To obtain the denominator for the rate:
   - Go to the U.S. Census Bureau's "Population Estimates" webpage:
     http://www.census.gov/popest/
   - Click on the blue box labeled "Data."
   - Find the row for "States" under the column "Level of Geography" and "Population by
     age, sex, race, and Hispanic origin" under the column "Level of Detail." Click on 'V2009'
     under the column "Latest Available Complete Vintage."
   - Scroll down to the heading "Downloadable Datasets."
   - Find the sub-heading "State Single Year of Age and Sex Population Estimates: April 1,
     2000 to July 1, 2009 - RESIDENT".
   - Click on CSV file.
   - You should see a message box pop up asking if you want to open or save this file. Select
     Open.
   - Highlight the top row (i.e., column headings).
   - Right click within the highlighted text and select Copy.
   - Open Excel, select Paste Special.
   - In the Paste Special box that appears, select Paste As CSV.

- Return to the census CSV file, scroll down to your state and highlight all rows pertaining to your state. Because Sex=0 (Column F) reflects both sexes, you just need to highlight the rows with Sex=0.
- Copy and paste as CSV into your Excel spreadsheet.
- Within the rows for which Sex=0, sum population for ages (Column G) 15 through 85 ("85" represents ages 85 and older) for the year of interest (e.g., "POPESTIMATE2009").

b) To calculate the crude inpatient hospitalization rate:
- Divide the sum of all age groups (numerator 9.1.1.) by the denominator (9.1.2a).
- Multiply this result by 1,000,000 to yield the **'Annual rate of total pneumoconiosis inpatient hospitalizations per million residents'.**

9.1.3 Annual, age-standardized, rate of inpatient hospitalization per million residents

- Use the US 2000 Standard population (provided in column E in table below) found at: http://www.cdc.gov/nchs/datawh/nchsdefs/ageadjustment.htm#aarates.
- Use table below to perform the calculations. A spreadsheet such as Excel works well for these calculations.
- In Column C (State Pop), enter the state's census population (found using population data referenced in 9.1.2) by age group for the relevant year (e.g., population estimates for 2005 if generating rates for 2005).
- In Column B (# Inpatient Hospitalizations), enter number of inpatient hospitalizations obtained in 9.1.1, by age groups for all pneumoconioses.
- Column D = Column B / Column C
  (Inpatient Hospitalizations/Pop) = (# Inpatient Hospitalizations) / (State Pop)
- Column F = Column D * Column E
  (# Expected Inpatient Hospitalizations) = (Inpatient Hospitalizations/Pop) * (US 2000 Standard Pop)
- The **'Annual age-adjusted total pneumoconiosis inpatient hospitalization rate per million' residents'= (F10 / E10) * 1,000,000**
  (The sum (Σ) of all expected total pneumoconiosis inpatient hospitalizations) / (the sum of US 2000 Standard Pop) multiplied by 1,000,000

	Age Group	Column B ### Inpatient Hospitalizations	Column C [year] State Pop	Column D Inpatient Hospitalizations/Pop	Column E US 2000 Std Pop	Column F # Expected Inpatient Hospitalizations
		State Resident Inpatient Hospitalizations, age 15 and older, [year]				
2	15-24			B2/C2	38,077,000	D2*E2
3	25-34			B3/C3	37,233,000	D3*E3
4	35-44			B4/C4	44,659,000	D4*E4
5	45-54			B5/C5	37,030,000	D5*E5
6	55-64			B6/C6	23,961,000	D6*E6
7	65-74			B7/C7	18,136,000	D7*E7
8	75-84			B8/C8	12,315,000	D8*E8
9	85+			B9/C9	4,259,000	D9*E9
19	Total				**215,670,000**	**Σ(F2:F9)**

9.2 Inpatient hospital discharges with a primary or contributing diagnosis of ICD-9 code 500 **("Coal Workers' Pneumoconiosis)**

9.2.1 Annual number of coal workers' pneumoconiosis inpatient hospital discharges
Follow directions for 9.1.1 using any diagnosis = '500'.

NOTE: If less than 5 events, the number may be too small to produce reliable estimates or may violate confidentiality requirements. Rates should not be calculated.

9.2.2 Annual rate of coal workers' pneumoconiosis inpatient hospitalizations per million residents
a) To obtain the denominator for the rate:
Follow directions for 9.1.2a.

b) To calculate the crude inpatient hospitalization rate:
• Divide the sum of all ages (numerator 9.2.1) by the denominator (9.2.2a).
• Multiply this result by 1,000,000 to yield the **'Annual rate of coal workers'**
  pneumoconiosis inpatient hospitalizations per million residents'.

9.2.3 Annual, age-standardized, rate of inpatient hospitalization per million residents
Follow directions for 9.1.3 using inpatient hospitalizations from 9.2.1.

9.3 Inpatient hospital discharges with a primary or contributing diagnosis of ICD-9 code 501
("Asbestosis")
9.3.1 Annual number of asbestosis inpatient hospital discharges
Follow directions for 9.1.1 using any diagnosis = '501'.

NOTE: If less than 5 events, the number may be too small to produce reliable estimates or
may violate confidentiality requirements. Rates should not be calculated.

9.3.2 Annual rate of asbestosis inpatient hospitalizations per million residents
a) To obtain the denominator for the rate:
 • Follow directions for 9.1.2a.

b) To calculate the crude inpatient hospitalization rate:
 • Divide the sum of all ages (numerator 9.3.1) by the denominator (9.3.2a).
 • Multiply this result by 1,000,000 to yield the **'Annual rate of asbestosis**
   inpatient hospitalizations per million residents'.

9.3.3 Annual, age-standardized, rate of asbestosis inpatient hospitalizations per million
       residents
Follow directions for 9.1.3 using inpatient hospitalizations from 9.3.1.

9.4 Inpatient hospital discharges with a primary or contributing diagnosis of ICD-9 code 502
("Silicosis")
9.4.1 Annual number of silicosis inpatient hospital discharges
Follow directions for 9.1.1 using any diagnosis = '502'.

NOTE: If less than 5 events, the number may be too small to produce reliable estimates or
may violate confidentiality requirements. Rates should not be calculated.

9.4.2 Annual rate of silicosis inpatient hospitalizations per million residents
a) To obtain the denominator for the rate:
• Follow directions for 9.1.2a.

- b) <u>To calculate the crude inpatient hospitalization rate:</u> Divide the sum of all ages (numerator 9.4.1) by the denominator (9.4.2a).
- Multiply this result by 1,000,000 to yield the **'Annual rate of silicosis inpatient hospitalizations per million residents'**.
- **9.4.3 <u>Annual, age-standardized, rate of silicosis inpatient hospitalizations per million residents</u>**

Follow directions for 9.1.3 using inpatient hospitalizations from 9.4.1.

9.5 Inpatient <u>hospital discharges with a primary or contributing diagnosis of ICD-9 code 503, 504 or 505</u> ("Other and Unspecified Pneumoconiosis")

9.5.1 <u>Annual number of other and unspecified pneumoconiosis inpatient hospital discharges</u>
Follow directions for 9.1.1 using any diagnosis = '503', '504' or '505'.

9.5.2 <u>Annual rate of other and unspecified pneumoconiosis inpatient hospitalizations per million residents</u>
a) <u>To obtain the denominator for the rate:</u>
- Follow directions for 9.1.2a.

b) To calculate the crude inpatient hospitalization rate:
- Divide the sum of all ages (numerator 9.5.1) by the denominator (9.5.2a).
- Multiply this result by 1,000,000 to yield the **'Annual rate of other and unspecified pneumoconiosis inpatient hospitalizations per million residents'.**

9.5.3 <u>Annual, age-standardized, rate of other and unspecified inpatient hospitalizations per million residents</u>
Follow directions for 9.1.3 using inpatient hospitalizations from 9.5.1.

NOTE: The sum of 9.2.1, 9.3.1, 9.4.1 and 9.5.1 may be more than 9.1.1 because cases could be hospitalized with more than one type of pneumoconiosis.

Topic:	OCCUPATIONAL ILLNESSES
INDICATOR #10:	**MORTALITY FROM OR WITH PNEUMOCONIOSIS**
Demographic Group:	Resident persons age 15 years or older
Numerator:	1. Deaths with ICD-10 code of J60-J66 (ICD-9 code 500-505) as the underlying or contributing cause of death ("total pneumoconiosis") 2. Deaths with ICD-10 code of J60 (ICD-9 code 500) as the underlying or contributing cause of death ("coal workers' pneumoconiosis") 3. Deaths with ICD-10 code of J61 (ICD-9 code 501) as the underlying or contributing cause of death ("asbestosis") 4. Deaths with ICD-10 code of J62 (ICD-9 code 502) as the underlying or contributing cause of death ("silicosis") 5. Deaths with ICD-10 code in the range J63 – J66 (ICD-9 code range 503 – 505) ("other and unspecified pneumoconiosis")
Denominator:	Midyear resident population age 15 years or older for the same calendar year
Measures of Frequency:	Annual number of deaths (numerator) Annual death rate (deaths per million residents) Annual age-standardized death rate (standardized by the direct method to the Year 2000 U.S. Standard population) (deaths per million residents)
Time Period:	Calendar year
Significance and Background:	Nearly all pneumoconioses are attributable to occupational exposure, and millions of workers are at risk. Common types include asbestosis, coal workers' pneumoconiosis, and silicosis. Pneumoconiosis is more commonly listed as a contributing cause of death than as the underlying cause of death. Consequently, this indicator monitors all listed causes of death on the death certificate.
Rationale:	Pneumoconiosis frequency varies geographically being largely determined by local industrial activities and migration of affected individuals. Control of occupational dust exposure is the single most effective means of preventing pneumoconiosis. Tracking of pneumoconiosis is essential for tracking progress towards elimination of the disease, as well as for targeting prevention and disease management programs.
Limitations of Indicator:	Because pneumoconioses are typically chronic diseases with a long latency (pre-clinical period), current incidence is not necessarily indicative of current exposures, and it may be several years before reductions in exposures affect mortality. In addition, people may not die in the state in which they were exposed.
Data Resources:	Death certificate records from vital statistics agency (numerator) State population estimates from the U.S. Bureau of the Census (denominator) Year 2000 U.S. Standard Population (for age-standardization)
Limitations of Data Resources:	Causes of death listed on the death certificate and coding of those causes may be inaccurate. The number of contributing cases of death listed on the death certificate may vary by person completing the death certificate and geographic region. Death certificates identify only a small percentage of the individuals who develop pneumoconiosis. Data on race/ethnicity is not collected in some states and is incomplete and/or of questionable validity in others. The state of residence upon death may not be the state of exposure.
HP2020 Objectives:	OSH-4
CSTE Positions:	1996-Env-02; 1999-Env-04
Other Available Data:	Age, gender, race/ethnicity, county of residence, usual occupation and industry
Recommendations:	Age, gender, race/ethnicity, and county-specific counts and rates can be used to better define the pattern of pneumoconiosis mortality. Because usual occupation and usual industry information is not necessarily indicative of the setting in which the causative

	exposure occurred, industry- and occupation-specific measures should be interpreted and reported with caution.

How-To Guide – Indicator #10:

MORTALITY FROM OR WITH PNEUMOCONIOSIS

10.1   Deaths with an ICD-10 code in the range J60-J66 as an underlying or contributing cause of death ("Total Pneumoconiosis")

10.1.1 Annual number of total pneumoconiosis deaths

Obtain from State Health Department's Office of Vital Records the following information:

- Number of deaths with ICD-10 code of J60 – J66.8 as the underlying or contributing cause of death. **Make sure that you emphasize that you want these counts based on contributing causes of death in addition to underlying cause. Obtaining counts based on underlying cause only will result in a significant undercount of cases.**
- Limit age to those 15 years and older.
- Select for state of residence='*your state'*.
- Exclude:
    – age unknown
    – out-of-state residents or unknown state of residence
    – out-of-state deaths
- Obtain the number of deaths for each of the following age groups: 15-24, 25-34, 35-44, 45-54, 55-64, 65-74, 75-84, 85 and over.
- This will yield the **'Annual number of total pneumoconiosis deaths'.**

NOTE: If less than 5 events, the number will be too small to produce reliable estimates. Rates should not be calculated.

10.1.2 Annual total pneumoconiosis death rate (deaths per million residents)
a) To obtain the denominator for the rate:
- Go to the U.S. Census Bureau's "Population Estimates" webpage: http://www.census.gov/popest/
- Click on the blue box labeled "Data."
- Find the row for "States" under the column "Level of Geography" and "Population by age, sex, race, and Hispanic origin" under the column "Level of Detail." Click on 'V2009' under the column "Latest Available Complete Vintage."
- Scroll down to the heading "Downloadable Datasets."
- Find the sub-heading "State Single Year of Age and Sex Population Estimates: April 1, 2000 to July 1, 2009 - RESIDENT".
- Click on CSV file.
- You should see a message box pop up asking if you want to open or save this file. Select Open.
- Highlight the top row (i.e., column headings).
- Right click within the highlighted text and select Copy.
- Open Excel, select Paste Special.
- In the Paste Special box that appears, select Paste As CSV.

- Return to the census CSV file, scroll down to your state and highlight all rows pertaining to your state. Because Sex=0 (Column F) reflects both sexes, you just need to highlight the rows with Sex=0.
- Copy and paste as CSV into your Excel spreadsheet.
- Within the rows for which Sex=0, sum population for ages (Column G) 15 through 85 ("85" represents ages 85 and older) for the year of interest (e.g., "POPESTIMATE2009").

b) **To calculate the crude annual death rate:**
- Divide the number of deaths for those aged 15 and older (numerator 10.1.1) by the population aged 15 and older for that year (10.1.2a).
- Multiply this result by 1,000,000 to yield the **'Annual total pneumoconiosis death rate (deaths per million residents)'.**

10.1.3. Annual age-standardized total pneumoconiosis death rate (deaths per million residents)
Use the US 2000 Standard population (provided in column E in table below) found at:
http://www.cdc.gov/nchs/data/statnt/statnt20.pdf.
- Use table below to perform the calculations. A spreadsheet such as Excel works well for these calculations.
- In Column C (State Population), enter the state's census population (found using population data referenced in 10.1.2) by age group for the relevant year (e.g., population estimates for 2009 if generating death rates for 2009).
- In Column B (# Deaths), enter number of deaths obtained in 10.1.1 by age group for all pneumoconioses.
- Column D = Column B / Column C
  (Deaths/Pop) = (# Deaths) / (State Population)
- Column F = Column D * Column E
  (# Expected Deaths) = (Deaths/Pop) * (US 2000 Standard Pop)
- **Age-standardized total pneumoconiosis death rate = (F10 / E10) * 1,000,000**
  [(The sum (Σ) of all expected deaths) / (the US 2000 Standard Population ages 15 and older)] multiplied by 1,000,000

		Column B	Column C	Column D	Column E	Column F
		State Resident Deaths, ages 15 and older, [year]				
	Age Group	# Deaths	[year] State Population	Deaths/Pop	US 2000 Std Pop	# Expected Deaths
2	15-24			B2/C2	38,077,000	D2*E2
3	25-34			B3/C3	37,233,000	D3*E3
4	35-44			B4/C4	44,659,000	D4*E4
5	45-54			B5/C5	37,030,000	D5*E5
6	55-64			B6/C6	23,961,000	D6*E6
7	65-74			B7/C7	18,136,000	D7*E7
8	75-84			B8/C8	12,315,000	D8*E8
9	85+			B9/C9	4,259,000	D9*E9
10	Total Ages 15+				215,670,000	Σ(F2:F9)

10.2   Deaths with ICD-10 code J60 as an underlying or contributing cause of death ("Coal Workers' Pneumoconiosis")

10.2.1 Annual number of coal workers' pneumoconiosis deaths

Follow directions for 10.1.1 using any cause of death = 'J60'.

NOTE: If less than 5 events, the number will be too small to produce reliable estimates. Rates should not be calculated.

10.2.2 Annual coal workers' pneumoconiosis death rate (deaths per million residents)

a) To obtain the denominator for the rate:
Follow directions for 10.1.2a.

b) To calculate the crude annual death rate:
- Divide the number of deaths for those aged 15 and older (numerator 10.2.1) by the population aged 15 and older for that year (10.2.2a).
- Multiply this result by 1,000,000 to yield the **'Annual coal workers' pneumoconiosis death rate (deaths per million residents)'.**

10.2.3 Annual, age-standardized, coal workers' pneumoconiosis death rate (deaths per million residents)

Follow directions for 10.1.3 using deaths from 10.2.1.

10.3   Deaths with ICD-10 code J61 as an underlying or contributing cause of death ("Asbestosis")

10.3.1 Annual number of asbestosis deaths

Follow directions for 10.1.1 using any cause of death = 'J61'.

NOTE: If less than 5 events, the number will be too small to produce reliable estimates. Rates should not be calculated.

10.3.2 Annual asbestosis death rate (deaths per million residents)

a) To obtain the denominator for the rate:
Follow directions for 10.1.2a.

b) To calculate the crude annual death rate:
- Divide the number of deaths for those aged 15 and older (numerator 10.3.1) by the population aged 15 and older for that year (10.3.2a).
- Multiply this result by 1,000,000 to yield the **'Annual asbestosis death rate (deaths per million residents)'.**

10.3.3 Annual, age-standardized, asbestosis death rate (deaths per million residents)

Follow directions for 10.1.3 using deaths from 10.3.1.

10.4   Deaths with ICD-10 code J62 as an underlying or contributing cause of death ("Silicosis")

10.4.1 Annual number of silicosis deaths

Follow directions for 10.1.1 using any cause of death = 'J62.0' – 'J62.8'.

NOTE: If less than 5 events, the number will be too small to produce reliable estimates. Rates should not be calculated.

10.4.2 Annual silicosis death rate (deaths per million residents)
a) To obtain the denominator for the rate:
Follow directions for 10.1.2a.

b) To calculate the crude annual death rate:
- Divide the number of deaths for those aged 15 and older (numerator 10.4.1) by the population aged 15 and older for that year (10.4.2a).
- Multiply this result by 1,000,000 to yield the **'Annual silicosis death rate (deaths per million residents)'.**

10.4.3 Annual, age-standardized death rate (deaths per million residents)
Follow directions for 10.1.3 using deaths from 10.4.1.

10.5 Deaths with an ICD-10 code in the range J63, J64, J65, or J66 as an underlying or contributing cause of death ("Other and Unspecified Pneumoconiosis")
10.5.1 Annual number of other and unspecified pneumoconiosis deaths
Follow directions for 10.1.1 using any cause of death = 'J63.0'- 'J63.8', 'J64', 'J65', 'J66.0'-'J66.8'.

NOTE: If less than 5 events, the number will be too small to produce reliable estimates. Rates should not be calculated.

10.5.2 Annual other and unspecified pneumoconiosis death rate (deaths per million residents)
a) To obtain the denominator for the rate:
Follow directions for 10.1.2a.

b) To calculate the crude annual death rate:
- Divide the number of deaths for those aged 15 and older (numerator 10.5.1) by the population aged 15 and older for that year (10.5.2a).
- Multiply this result by 1,000,000 to yield the **'Annual other and unspecified pneumoconiosis death rate (deaths per million residents)'.**

10.5.3 Annual, age-standardized other and unspecified pneumoconiosis death rate (deaths per million residents)
Follow directions for 10.1.3 using deaths from 10.5.1.

NOTE: The sum of 10.2.1, 10.3.1, 10.4.1 and 10.5.1 may be greater than 10.1.1 because cases could have more than one type of pneumoconiosis listed on the death certificate.

Topic: OCCUPATIONAL ILLNESSES

INDICATOR #11: ACUTE WORK-RELATED PESTICIDE-ASSOCIATED ILLNESS AND INJURY REPORTED TO POISON CONTROL CENTERS

Demographic Group:	Employed persons
Numerator:	Reported cases of work-related pesticide poisoning
Denominator:	Employed persons age 16 years and older for the same calendar year
Measures of Frequency:	Annual number of reported cases of work-related pesticide poisoning (numerator) Annual incidence rate of reported cases of work-related pesticide poisoning per 100,000 employed persons age 16 years or older
Time Period:	Calendar year
Significance and Background:	Pesticides are among the few chemicals produced that are specifically designed to kill and cause harm. In the US, approximately one billion pounds of pesticide active ingredient are used annually, and over 20,000 pesticide products are being marketed (EPA *Pesticides Industry Sales and Usage,* 2006-2007). The EPA estimates 20,000 - 40,000 work-related pesticide poisonings per year (Blondell, 1997).
Rationale:	Workers who handle pesticides are at increased risk for exposure. Poison Control Centers (PCCs) are important sources of reports of acute poisonings and chemical exposures. These data can be useful to target prevention. The type of data collected is comparable across states due to the uniformity in case handling by PCCs.
Limitations of Indicator:	PCCs capture only a small proportion of acute occupational pesticide-related illness cases, an estimated 10%. PCCs do not systematically collect information on industry and occupation; however, cases associated with occupational exposures can be identified.
Data Resources:	Poison Control Center data (numerator) BLS Current Population Survey Data (denominator)
Limitations of Data Resources:	Not all states have poison control centers. State health agencies may have to enter into an agreement with their state-based PCC to obtain local data, or may obtain less timely PCC data from the Toxic Exposure Surveillance System, which is administered by the American Association of Poison Control Centers.
HP2020 Objectives:	None
CSTE Positions:	1996-Env-16; 1999-Env-3
Other Available Data:	Age, gender, pesticide active ingredient, signs/symptoms arising from the pesticide exposures, illness severity, and whether hospitalization/ICU treatment was provided.
Recommendations:	Age, gender, pesticide chemical class, and severity-specific counts and rates can be used to better define the pattern of acute occupational pesticide-related illness. Industry and occupation should be analyzed where available.

HOW-TO GUIDE – INDICATOR #11:

ACUTE WORK-RELATED PESTICIDE ASSOCIATED ILLNESS AND INJURY REPORTED TO POISON CONTROL CENTERS

11.1 **Annual number of reported work-related pesticide poisoning cases[2]**
- Contact Matthew Groenewold at NIOSH (gyr5@cdc.gov or 513-841-4329) to obtain 'Annual number of reported work-related pesticide poisoning cases.'

11.2 **Annual incidence rate of reported work-related pesticide poisoning cases per 100,000 employed persons age 16 years or older**

a) To obtain the denominator for the rate:
- Go to: http://www.bls.gov/gps/home.htm to access the Geographic Profile of Employment and Unemployment which contains Current Population Survey estimates for state-specific numbers of employed persons.
- Scroll down to "TABLES CREATED BY BLS."
- Select year of interest.
- Within the pdf document, find your state.
- The heading in the first column "Population group" should be "TOTAL."
- The value under "Employment Number" (4th data column) represents the number of employed persons age 16 and older in thousands.
- Multiply the value for Total Employment by 1,000.

b) To calculate the rate:
- Divide the numerator (11.1) by the denominator (11.2a).
- Multiply this result by 100,000 to get the 'Annual incidence rate of reported work-related pesticide poisonings per 100,000 employed persons age 16 years or older.'

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[2] These data are derived from data provided by the American Association of Poison Control Centers (AAPCC) using the case definition listed in this guide. There may be a discrepancy between the number of incident cases provided by EPA/NIOSH/AAPCC and the number of cases derived from your local PCC.

States are encouraged to contact their local Poison Control Center (PCC) to share the data obtained through AAPCC and to discuss plans to disseminate it. Contact information can be obtained from AAPCC http://www.aapcc.org/director2.htm. Some states have more than one PCC.

The criteria utilized by NIOSH/AAPCC for identifying work-related pesticide poisonings are provided below:

1. Reason for the call (ExpReason) = 3 (occupational) OR
   Exposure Site (ExpSite) = 3 (workplace)

2. Medical outcome (MedicalOutcome) =
   201=minor effect
   202=moderate effect
   203=major effect
   204=death
   206=not followed, minimal clinical effects possible
   207=unable to follow, judged as a potentially toxic exposure

3. Exclude cases where Exposure Site (ExpSite) = 3 (workplace) AND (ExpReason) = 9 (suspected suicide), 11 (intentional abuse), 12 (intentional action but specific intention unknown), 14 (malicious), or 18 (unknown reason).

4. Include only cases exposed to one substance (The variable to make this assessment changed in 1999. Before 1999, cases exposed to only one substance had **Multiple=missing** (if **Multiple=1** then the case was exposed to more than one substance). Beginning in 1999, cases exposed to only one substance had **Noofsubs=1** (if **Noofsubs > 1** then the case was exposed to more than one substance).

5. Remove children less than 16 years of age. This can be handled by using the variables age (**Age**) and patient age unit variable (**PatAgeUnit**). **Age** must be greater than or equal to 16. If **PatAgeUnit** equals 1 (<=5 years), 2 (6-12 years), 16 (months) or 17 (days) then delete.

6. Include only cases with in-state residence or unknown residence.

7. Exposure to an agent included in one of the pesticide generic categories
   Disinfectants
   0201008 disinfectant industrial cleaner
   0201055 bromine water/shock treatment
   0201056 chlorine water/shock treatment
   0042281 hypochlorite disinfectant: hypochlorite, non-bleach product
   0040280 phenol disinfectant: phenol (eg, lysol)
   0039282 pine oil disinfectant
   0077286 other/unknown disinfectant

   Fungicides (non-medicinal)
   0243566 carbamate fungicide
   0201033 copper compound fungicide
   0077564 mercurial fungicide
   0077565 non-mercurial (inactive) fungicide

0253000 phthalimide fungicide
0254371 wood preservative
0077566 other/unknown (inactive) non-medicinal fungicide
0201034 other non-medicinal fungicide
0201035 unknown non-medicinal fungicide

Fumigants
0201036 aluminum phosphide fumigant
0201037 metam sodium (fumigant, fungicide, or herbicide)
0201038 methyl bromide (fumigant, fungicide, or herbicide)
0201039 sulfuryl fluoride fumigant
0201040 other fumigant
0201041 unknown fumigant

Herbicides (includes algicides, defoliants, dessicants, plant growth regulators)
0201054 algicide
0254370 anti-algae paint: anti-algae
0243561 carbamate herbicide
0017000 2,4-d or 2,4,5-t (inactive)
0201042 chlorophenoxy herbicide
0049562 diquat
0201043 glyphosate
0049000 paraquat
0049561 paraquat/diquat combination
0077121 plant hormone
0213000 triazine herbicide
0215000 urea herbicide
0077561 other herbicide
0077567 unknown herbicide

Insecticides (includes insect growth regulators, molluscicides, nematicides)
0004562 arsenic pesticide
0062562 borate/boric acid pesticide
0070000 carbamate only (alone)
0070560 carbamate with other insecticide
0050000 chlorinated hydrocarbon only (alone)
0050560 chlorinated hydrocarbon with other insecticide
0201044 insect growth regulator
0172000 metaldehyde(molluscicide)
0208562 nicotine(excluding tobacco products)
0038000 organophosphate
0038560 organophosphate/carbamate combined
0038561 organophosphate/chlorinated hydrocarbon (inactive)
0038562 organophosphate/other insecticide
0038563 organophosphate/carbamate/chlorinated hydrocarbon (inactive)
0176000 piperonyl butoxide only (inactive)

0144000 piperonyl butoxide/pyrethrin (inactive) (without carbamate or o.p.)
0144001 pyrethrins only (inactive)
0201045 pyrethrin
0201046 pyrethroid
0145000 rotenone
0077568 veterinary insecticide (inactive) (for pets-flea collars, etc.)

Repellents
0201047 bird, dog, deer or other mammal repellent
0201048 insect repellent with deet
0201049 insect repellent without deet
0218000 *insect repellent: unknown (inactive) insect repellents: unknown*
0033000 naphthalene moth repellent
0050430 paradichlorobenzene moth repellent
0077431 other mothball or moth repellent
0077430 unknown mothball or moth repellent

Rodenticides
0174000 antu
0048563 anticoagulant: warfarin-type anticoagulant rodenticide
0048564 anticoagulant: long-acting, superwarfarin anticoagulant rodenticide
0244577 barium carbonate barium carbonate containing rodenticides
0201050 bromethalin
0201051 cholecalciferol rodenticide
0012563 cyanide rodenticide (excluding industrial or misc. Chemical)
0162000 monofluoroacetate 1080/monofluoroacetate/smfa
0043000 strychnine rodenticide
0197000 vacor/pnu
0201052 zinc phosphide
0217000 thallium
0077563 other rodenticide
0077577 unknown rodenticide

Topic:	OCCUPATIONAL ILLNESSES

INDICATOR #12:   INCIDENCE OF MALIGNANT MESOTHELIOMA

Demographic Group:	Resident persons age 15 years or older
Numerator:	Incident cases with mesothelioma
Denominator:	Midyear resident population age 15 years or older for the same calendar year
Measures of Frequency:	Annual number of incident mesothelioma cases (numerator) Annual mesothelioma incidence rate (cases per million residents) Annual, age-standardized, mesothelioma incidence rate (standardized by the direct method to the Year 2000 U.S. Standard population) (cases per million residents)
Time Period:	Calendar year
Significance and Background:	About 3,000 deaths with malignant mesothelioma occur each year in the United States (North American Association of Central Cancer Registries, 2008). The only well established risk factor for malignant mesothelioma is exposure to asbestos and related fibers. It has been estimated that as much as 90 percent of cases are caused by exposure to asbestos.
Rationale:	Malignant mesothelioma, while relatively rare, is a fatal cancer largely attributable to workplace exposure to asbestos. Tracking of malignant mesothelioma should be undertaken to document the burden of occupational disease, to design, target, and evaluate the impact of prevention efforts over time, and to identify previously unrecognized settings in which workers may continue to be at risk of asbestos exposure.
Limitations of Indicator:	Not all cases of malignant mesothelioma are caused by occupational exposures. Because cancer is a disease of long latency, current incidence is not indicative of current exposures and it may be many years before reductions in occupational exposures affect incidence. State of residence of the decedent may not have been the state of exposure.
Data Resources:	State-wide Cancer Registry data (numerator) State population estimates from the U.S. Bureau of the Census (denominator) Year 2000 US Standard population (for age-standardization)
Limitations of Data Resources:	Data from some existing statewide central cancer registries do not yet meet standards for data completeness and quality. Until complete cancer registry data is available in all states, aggregation of state data to produce nationwide estimates will be incomplete.
HP2020 Objectives:	None
CSTE Positions:	None
Other Available Data:	Age, gender, race/ethnicity, county of residence, usual occupation and industry
Recommendations:	Age, gender, race/ethnicity, county counts and rates can be used to better define patterns of malignant mesothelioma. Because usual occupation and usual industry information is not necessarily indicative of the setting in which the causative exposure occurred, industry- and occupation-specific measures should be interpreted and reported with caution.

12.1 Annual number of incident mesothelioma cases

Obtain from the State Cancer Registry the number of incident cases meeting the following criteria:

- ICD-O histology code of 9050-9053.
- Limit age to those 15 years and older
- Select for state of residence = '*your state*'
- Exclude:
  - age unknown
  - out-of-state residents and unknown state of residence
- Obtain the number of cases for each of the following age groups: 15-24, 25-34, 35-44, 45-54, 55-64, 65-74, 75-84, 85 and over.
- This will yield the **'Annual number of incident mesothelioma cases'**.

NOTE: If less than 5 events, the number will be too small to produce reliable estimates. Rates should not be calculated.

12.2 Annual mesothelioma incidence rate (cases per million residents)

    a) To obtain the denominator for the rate:
- Go to the U.S. Census Bureau's "Population Estimates" webpage: http://www.census.gov/popest/
- Click on the blue box labeled "Data."
- Find the row for "States" under the column "Level of Geography" and "Population by age, sex, race, and Hispanic origin" under the column "Level of Detail." Click on 'V2009' under the column "Latest Available Complete Vintage."
- Scroll down to the heading "Downloadable Datasets."
- Find the sub-heading "State Single Year of Age and Sex Population Estimates: April 1, 2000 to July 1, 2009 - RESIDENT".
- Click on CSV file.
- You should see a message box pop up asking if you want to open or save this file. Select Open.
- Highlight the top row (i.e., column headings).
- Right click within the highlighted text and select Copy.
- Open Excel, select Paste Special.
- In the Paste Special box that appears, select Paste As CSV.
- Return to the census CSV file, scroll down to your state and highlight all rows pertaining to your state. Because Sex=0 (Column F) reflects both sexes, you just need to highlight the rows with Sex=0.
- Copy and paste as CSV into your Excel spreadsheet.
- Within the rows for which Sex=0, sum population for ages (Column G) 15 through 85 ("85" represents ages 85 and older) for the year of interest (e.g. "POPESTIMATE2009").

b) <u>To calculate the annual incidence rate:</u>
- Divide the number of cases for those aged 15 and older (numerator 12.1) by the population aged 15 and older for that year (12.2a).
- Multiply this result by 1,000,000 to obtain the **'Annual mesothelioma incidence rate (cases per million residents)'.**

12.3   Annual, age-standardized mesothelioma incidence rate (cases per million residents)
- Use the US 2000 Standard population (provided in column E in table below) found at: <mark>http://www.cdc.gov/nchs/data/statnt/statnt20.pdf</mark>
    - Use table below to calculate the age-standardized incidence rate. A spreadsheet such as Excel works well for these calculations.
    - In Column C (State Population), enter the state's census population (found using population referenced in 12.2a) by age group for the relevant year (e.g., population estimates for <mark>2009</mark> if generating rates for <mark>2009</mark>).
    - In Column B (# Mesothelioma Cases), enter the number of mesothelioma cases, obtained in 12.1, by age group.
    - Column D = Column B / Column C
(Mesothelioma Cases/Pop = # Mesothelioma Cases / State Population)
    - Column F = Column D * Column E
(# Expected Mesothelioma Cases = (Mesothelioma Cases/Pop) * (US 2000 Standard Pop))
    - **Age-standardized incidence rate for mesothelioma = (F10 / E10) * 1,000,000**
[(The sum (Σ) of all expected mesothelioma cases) / (the US 2000 Standard Population ages 15 and older)] multiplied by 1,000,000

		Column B	Column C	Column D	Column E	Column F
		State Resident Mesothelioma Cases, ages 15 and older, [year]				
	Age Group	**# Mesothelioma Cases**	**[year] State Population**	**Mesothelioma Cases/Pop**	**US 2000 Std Pop**	**# Expected Mesothelioma Cases**
2	**15-24**			B2/C2	38,077,000	D2*E2
3	**25-34**			B3/C3	37,233,000	D3*E3
4	**35-44**			B4/C4	44,659,000	D4*E4
5	**45-54**			B5/C5	37,030,000	D5*E5
6	**55-64**			B6/C6	23,961,000	D6*E6
7	**65-74**			B7/C7	18,136,000	D7*E7
8	**75-84**			B8/C8	12,315,000	D8*E8
9	**85+**			B9/C9	4,259,000	D9*E9
10	**Total**				**215,670,000**	**Σ(F2:F9)**

Topic: OCCUPATIONAL EXPOSURES INDICATOR #13: ELEVATED BLOOD LEAD LEVELS AMONG ADULTS	
Demographic Group:	Employed persons
Numerators:	1. All reported state residents age 16 years or older, with a blood lead level of ≥ 10 μg/dL 2. All reported state residents age 16 years or older, with a blood lead level of ≥ 25 μg/dL 3. All reported state residents age 16 years or older, with a blood lead level of ≥ 40 μg/dL
Denominator:	Employed population age 16 years or older for the same calendar year
Measures of Frequency:	Annual number of residents with elevated blood lead levels (numerator) Annual prevalence rate per 100,000 employed persons age 16 years or older Annual number of incident cases of residents with elevated blood lead levels Annual incidence rate per 100,000 employed persons age 16 years or older
Time Period:	Calendar year
Significance and Background:	The current surveillance case definition for an elevated BLL used by the Centers for Disease Control and Prevention (CDC) and National Institute of Occupational Safety and Health (NIOSH) includes workers age 16 and older, with blood lead concentrations of ≥ 10 μg/dL. In 2010, the CDC included, for the first time, elevated BLLs defined by the same blood lead concentration (≥ 10 μg/dL), as a Nationally Notifiable Non-Infectious Condition. In 2006, reporting systems operating in 38 states enumerated 24,291 adults with blood lead levels (BLLs) greater than or equal to 10 μg/dL. Among these 24,291 adults, about 39.4 percent had levels greater than or equal to 25 μg/dL, and 6.0 percent had levels greater than or equal to 40 μg/dL. Lead adversely affects multiple organ systems and can cause permanent damage. There is increasing concern over the toxicity of lead at low doses and its association with hypertension, adverse effects on renal function, cognitive dysfunction, and adverse female reproductive outcome. Children also suffer the adverse effects of lead and about 24,000 U.S. children with BLLs of 10 μg/dL or greater are estimated to be exposed from lead unintentionally brought home by a parent from the workplace. Pediatric effects include neurologic damage, learning disabilities, and behavior problems.
Rationale:	Among adults, lead poisoning is a persistent, mainly occupational, health issue that continues to be an important public health problem. The most widely available test for exposure is the BLL. The Federal Occupational Safety and Health Administration (OSHA) lead standards to protect workers from lead-associated health effects include requirements for monitoring BLLs among employees who meet certain exposure criteria. The standards are based on medical information that is now more than 30 years old and are not protective against the adverse health effects of lead. Lower medical removal recommendations have been proposed to protect workers against the adverse health effects of both acute and cumulative lead exposures. It is important to note that the average BLL for the general population is less than 1.5 μg/dL.

Limitations of Indicator:	BLLs reflect the contributions of acute external exposure to lead as well as the release of internal bone lead stores into the blood. For persons without significant lead body burden, a BLLs is a good indicator of recent (preceding 3-5 weeks) external lead exposure. For persons with significant body burden, a single BLL may not be an accurate indicator of recent external exposure, as lead is also being released into the blood from bone stores.
Data Resources:	Reports of elevated BLLs from laboratories (numerator) BLS Current Population Survey Data (denominator)
Limitations of Data Resources:	Some states do not require laboratories to report all BLLs, or have no BLL reporting requirement in place. Even with a reporting requirement, data from laboratories are frequently incomplete. Many workers with significant occupational lead exposure are not appropriately tested. An individual's lead exposure and BLL testing may be done in the same or in different states (which may not be the individual's state of residence). Approximately 10-15% of elevated BLLs among adults can be caused by non-occupational exposures. Not all states may be able to distinguish occupationally exposed individuals from non-occupationally exposed individuals. Not all states may be able to determine both state of employment/exposure and state of residence of their reported cases.
HP2020 Objectives:	OSH-7
CSTE Positions:	1990-Env-9; 1995-Env-14; 1999-Env-02; 2000-Occ-01; 2001-Occ-01; 2009-Occ-02
Other Available Data:	Age, gender, industry, occupation, individual BLL, and all lead test reports (i.e., not just those exceeding the specified criteria)
Recommendations:	Because adverse health effects can begin at BLLs below 10 μg/dL, it is recommended that states also calculate the number and rate of elevated BLLs at 5 μg/dL. In addition, many states have data elements that can be used to better define the pattern of elevated blood lead levels. Report numbers and rates for occupational cases only, rather than including both occupationally and non-occupationally exposed persons in the numerator. Include occupationally exposed cases working in your state (e.g., employer is based in your state, or, if able to determine, worksite is in your state), regardless of their state of residence. Age, gender, and race/ethnicity specific counts and rates can be used to better define the pattern of elevated BLLs. Industry and occupation information can be used to provide additional insight. Individual BLLs can help identify particularly egregious exposures. Follow-up of selected cases and/or clusters can help identify where/how individuals with high BLLs were exposed. Obtaining reports on all BLLs can provide insight about the overall frequency of BLL testing, and allow follow-up of employers not doing required testing.

ELEVATED BLOOD LEAD LEVELS AMONG ADULTS

13.1 Persons age 16 years or older with a blood lead level of >= 10 μg/dL
    13.1.1 Annual number of residents with elevated blood lead levels (>=10 μg/dL)

Contact state Adult Blood Lead Epidemiology Surveillance (ABLES) program:
www.cdc.gov/niosh/ables.html

• Request data according to the following criteria for the calendar year:
– Blood lead level (BLL) >= 10 μg/dL
– Age 16 years and older
– Earliest date of either draw date, date laboratory received sample, or date laboratory analyzed
   sample
– If a person is reported more than once during the time period, count that person one   time
   only, at his/her highest BLL
– Include all cases, both occupationally and non-occupationally exposed
– Include all residents of state and unknown residence
– Exclude out-of-state residents
• This will yield the **'Annual number of residents with blood lead levels >= 10 μg/dL'.**

13.1.2 Annual prevalence rate per 100,000 employed persons
a) To obtain the denominator for the rate:
• Go to http://www.bls.gov/gps/#tables to access the Geographic Profile of Employment and
   Unemployment (GPS) which contains Current Population Survey estimates for state-specific
   numbers of employed persons
• Page down to heading "TABLES CREATED BY BLS:"
• Find table for "Employment status of the civilian non-institutional population in states by sex,
   race, Hispanic or Latino ethnicity, marital status, and detailed age:" Note: Data from 1997
   through 2002 can be found at http://www.bls.gov/opub/gp/laugp.htm
• Choose the Annual Averages for year of interest
• Scroll down to find your state.
• Read the 'Total' row for your state and the 4th data column – 'Employment Number**'. This is
   the 'Number of Employed persons age 16 years or older'** (in thousands). Multiply by 1000.

b) To calculate the rate:
• Divide the numerator (13.1.1) by the denominator (13.1.2a).
• Multiply this result by 100,000 to get the **'Annual prevalence rate per 100,000 employed
   persons age 16 years or older'.**

13.1.3 Annual number of incident cases
Use the ABLES definition of an incident case: Case with a BLL of >=10 μg/dL reported in the
calendar year, but was not reported in the immediately preceding year with a BLL of >=10 μg/dL
(may appear in earlier years with a BLL of 10 μg/dL or greater).

13.1.4 Annual incidence rate per 100,000 employed persons
a) To obtain the denominator for the rate:
Follow directions for 13.1.2.

b) To calculate the rate:
• Divide the numerator (13.1.3) by the denominator (13.1.2a)
• Multiply this result by 100,000 to get the **'Annual incidence rate per 100,000 employed persons age 16 years or older'.**

13.2 Persons age 16 years or older with a blood lead level of >= 25 µg/dL
  13.2.1 Annual number of residents with elevated blood lead levels (>=25 µg/dL)

Contact state Adult Blood Lead Epidemiology Surveillance (ABLES) program:
www.cdc.gov/niosh/ables.html

• Request data according to the following criteria for the calendar year:
– Blood lead level (BLL) >= 25 µg/dL
– Age 16 years and older
– Earliest date of either draw date, date laboratory received sample, or date laboratory analyzed sample
– If a person is reported more than once during the time period, count that person one time only, at his/her highest BLL
– Include all cases, both occupationally and non-occupationally exposed
– Include all residents of state and unknown residence
– Exclude out-of-state residents
• This will yield the **'Annual number of residents with blood lead levels >= 25 µg/dL'.**

13.2.2 Annual prevalence rate per 100,000 employed persons
a) To obtain the denominator for the rate:
    Follow directions for 13.1.2.

b) To calculate the rate:
• Divide the numerator (13.2.1) by the denominator (13.2.2a).
• Multiply this result by 100,000 to get the **'Annual prevalence rate per 100,000 employed persons age 16 years or older'.**

13.2.3 Annual number of incident cases
Use the ABLES definition of an incident case: Case with a BLL of >= 25 µg/dL reported in the calendar year, but was not reported in the immediately preceding year with a BLL of >= 25 µg/dL (may appear in earlier years with a BLL of 25 µg/dL or greater).

13.2.4 Annual incidence rate per 100,000 employed persons
a) To obtain the denominator for the rate:
    Follow directions for 13.2.2.

b) To calculate the rate:

- Divide the numerator (13.3.3) by the denominator (13.2.2a)
- Multiply this result by 100,000 to get the **'Annual incidence rate per 100,000 employed persons age 16 years or older'.**

13.3 Persons age 16 years or older with a blood lead level of >= 40 μg/dL

13.3.1 Annual number of residents with blood lead levels >= 40 μg/dL
Follow data request from 13.1.1 for BLL >= 40 μg/dL

13.3.2 Annual prevalence rate per 100,000 employed persons
a) To obtain the denominator for the rate:
Follow directions for 13.1.2.   (Leave as is)

b) To calculate the rate:
- Divide the numerator (13.3.1) by the denominator (13.3.2a)
- Multiply this result by 100,000 to get the **'Annual prevalence rate per 100,000 employed persons age 16 years or older'.**

13.3.3 Annual number of incident cases
Use the ABLES definition of an incident case: Case with a BLL of >= 40 μg/dL reported in the calendar year, but was not reported in the immediately preceding year with a BLL of >= 40 μg/dL (may appear in earlier years with a BLL of 40 μg/dL or greater).

13.3.4 Annual incidence rate per 100,000 employed persons
a) To obtain the denominator for the rate:
Follow directions for 13.1.2.

b) To calculate the rate:
- Divide the numerator (13.3.3) by the denominator (13.3.2a).
- Multiply this result by 100,000 to get the **'Annual incidence rate per 100,000 employed persons age 16 years or older'.**

Topic:	OCCUPATIONAL HAZARDS
INDICATOR #14:	**PERCENTAGE OF WORKERS EMPLOYED IN INDUSTRIES AT HIGH RISK FOR OCCUPATIONAL MORBIDITY**

Demographic Group:	Employed persons
Numerator:	Employed workers, 16 years of age and older, in private sector industries at high-risk for occupational morbidity
Denominator:	Employed persons age 16 years or older in all private sector industries for same calendar year
Measures of Frequency:	Number of employed persons in high morbidity risk NAICS industries* Percentage of employed persons in high morbidity risk North American Industry Classification System (NAICS) industries. * The industries comprising "high morbidity risk" will be reviewed and updated every five years.
Time Period:	Calendar year
Significance and Background:	In 2008, the U.S. Bureau of Labor Statistics (BLS) reported an estimated total of 3.7 million injury and illness cases within the private sector workforce, and an estimated incidence rate of 3.9 cases per 100 full-time-equivalent workers. There are industries that have significantly higher injury and illness rates than this national average. Fifty-five industries had occupational injury and illness rates of 7.8 cases per 100 full-time workers or higher in 2008. These industries accounted for 7.96 million workers in the U.S. (6.6% of the private sector non-farm wage and salary employment), but 16% of the OSHA reportable injuries and illnesses in 2008.
Rationale:	Work-related injuries and illnesses are preventable, and control of occupational hazards is the most effective means of prevention. Concentrating on high-risk industries for non-fatal injuries and illnesses helps prioritize limited resources.
Limitations of Indicator:	It is possible that some new employers are not counted in the County Business Patterns mid-March survey. In addition, differences in regional industrial practices may cause the ranking of high-risk industries within a specific State to differ from those identified from national data.
Data Resources:	U.S. Census Bureau County Business Patterns (CBP) (numerator and denominator)
Limitations of Data Resources:	The SOII is a function of BLS using a probability sample and not a census of all employers. It is based on injury and illness data maintained by employers and is subject to sampling error. There is a potential for additional sampling error if an employer has more than 30 cases with days away from work as an employer is only required to report on 30 such cases. Excluded from the survey are the military, self-employed individuals, farms with fewer than 11 employees, and Federal agencies. In some states, the survey does not cover the state and municipal employees. Therefore, the recommended measures of frequency are limited to private sector workforce only. Some states do not participate in the Federal-State survey, and in some participating states, the sample sizes are insufficient to generate State-specific estimates. Numbers and rates may not be published/released by BLS due to the reliability of the estimates. Employers vary with respect to how much they may reduce their potential reporting burden by placing affected workers on restricted work activity, thereby avoiding the reporting of lost workday cases (which require reporting of additional details). In addition, the SOII only collects data for the incident year, and does not capture lost work-time that may carry over to a new calendar year. For example, a debilitating injury that occurs on the last day of the calendar year will have no lost work-time associated with it in the SOII. The CBP is based on mid-March payrolls of all employers in the United States, but does not cover farms, public administration, or the self-employed. Exact employment counts for a particular NAICS may not be provided within a State because of confidentiality issues.

	None
CSTE Positions:	None
Other Available Data:	None
Recommendations:	States could additionally identify their own State-specific high-risk industries and associated employment patterns.

How-To Guide – Indicator #14:

PERCENTAGE OF WORKERS EMPLOYED IN INDUSTRIES AT HIGH RISK FOR OCCUPATIONAL MORBIDITY

14.1   Number of employed persons in high morbidity risk North American Industry Classification System (NAICS) industries

The following are the high risk morbidity industries based on Bureau of Labor Statistics "total reportable cases incidence rates" for private sector workers for the year 2008. So that states may collect trend data for this indicator, this list will be used through 2012. CSTE will review and update this list every 5 years thereafter.

Table 1. NAICS codes and Industry Titles for High Morbidity Risk Industries

2002 NAICS	Industry Title
115111	Cotton Ginning
311311	Sugarcane Milling
311511	Fluid Milk Manufacturing
311611	Animal Slaughtering Except Poultry
311613	Rendering and Meat Byproduct Processing
311711	Seafood Canning
31211	Soft Drink and Ice Manufacturing
3161	Leather and Hide Tanning and Finishing
321214	Truss manufacturing
32192	Wood Container and Pallet Manufacturing
32199	All Other Wood Product Manufacturing
326212	Tire Retreading
327113	Porcelain Electrical Supply Manufacturing
327332	Concrete Pipe Manufacturing
32739	Other Concrete Product Manufacturing
33122	Rolling and Drawing of Purchased Steel
331314	Secondary Smelting and Alloying of Aluminum
3315	Foundries
3321	Forging and Stamping
332214	Kitchen Utensil, Pot, and Pan Manufacturing
3323	Architectural and Structural Metals Manufacturing
332439	Other Metal Container Manufacturing
332618	Other Fabricated Wire Product Manufacturing
332721	Precision Turned Product Manufacturing
332997	Industrial Pattern Manufacturing
332999	All Other Miscellaneous Fabricated Metal Product Man.
33311	Agricultural Implement Manufacturing
33321	Sawmill and Woodworking Machinery Manufacturing
333291	Paper Industry Machinery Manufacturing
333294	Food Product Machinery Manufacturing
333312	Commercial Laundry and Dry Cleaning Machinery Manufacturing

333412	Industrial and Commercial Fan and Blower Manufacturing
333923	Overhead Cranes, Hoists, and Monorail Systems Manufacturing
336112	Light Truck and Utility Vehicle Manufacturing
33612	Heavy Duty Truck Manufacturing
3362	Motor Vehicle Body and Trailer Manufacturing
33636	Motor Vehicle Seating and Interior Trim Manufacturing
33637	Motor Vehicle Metal Stamping
3366	Ship and Boat Building
337124	Metal Household Furniture Manufacturing
337127	Institutional Furniture Manufacturing
4248	Beer, Wine, and Distilled Alcoholic Beverage Wholesalers
45391	Pet and Pet Supplies Stores
481	Air Transportation
48832	Marine Cargo Handling
4889	Other Support Activities for Transportation
492	Couriers and Messengers
49312	Refrigerated Warehousing and Storage
54194	Veterinary Services
6219	Other Ambulatory Health Care Services
6223	Specialty Hospitals Except Psychiatric and Substance Abuse
623	Nursing and Residential Care Facilities
7112	Spectator Sports
71392	Skiing Facilities
7223	Special Food Services

- To facilitate tracking and calculating number of employed persons, it is recommended that you copy and paste Table 1 into an excel spreadsheet.
- Go to http://censtats.census.gov/cbpnaic/cbpnaic.shtml
- Select your state from the drop-down window in the County Business Patterns section and click on "Go".
- To choose a different year, select year from pull-down menu and click on "Go".
- Find the first two digits of a code of interest in the column labeled "Industry Code" (or if not listed, find the two digits that are closest without going higher), and click the "Detail" button to the left. Find the code in the detailed list and read the 3rd column, "**Paid employees for pay period including March 12."** This is the number of employed persons in that industry.
- Copy and paste the number into an Excel spreadsheet.
- Find the employment number for each code of interest. If the first two digits in a code are different than in the previous code, you may need to click the "back" arr**ow to return to the full list, then click the "Detail" button corresponding to the first two digits of the ne**w code. If you cannot find the exact code, enter 0. For some codes, a letter will be entered. This letter refers to the range of employees for that particular industry. Refer to the table below for number ranges associated with each letter. Use the midpoint of the range.

A	0-19
B	20-99

C	100-249
D	250-499
F	500-999
G	1,000-2,499
H	2,500-4,999
I	5,000-9,999
J	10,000-24,999
K	25,000-49,999
L	50,000-99,999

- Add the numbers of employees from each industry (using midpoints where necessary). This is the **"Number of workers employed in high-risk industries"**.

14.2   Percentage of employed persons in high morbidity risk North American Industry Classification System (NAICS) industries

a) To obtain the denominator for the percentage:
- Go to http://censtats.census.gov/cbpnaic/cbpnaic.shtml
- Select your state from the drop-down window in the County Business Patterns section and click on "Go".
- To choose a different year, select year from pull-down menu and click on "Go".
- To get data on the total employed population, read the top row and the 3rd column **"Number of Employees for week including March 12"**.

b) To calculate the percentage:
- Divide the number of workers employed in high-risk industries (14.1) by the number of employed persons (14.2a).
- Multiply this result by 100 to get the **"Percentage of employed persons in high morbidity risk industries"**.

Topic: OCCUPATIONAL HAZARDS INDICATOR #15: PERCENTAGE OF WORKERS EMPLOYED IN OCCUPATIONS AT HIGH RISK FOR OCCUPATIONAL MORBIDITY	
Demographic Group:	Employed persons
Numerator:	Employed persons age 16 years or older, in private sector occupations at high risk for occupational morbidity
Denominator:	Employed persons age 16 years or older, in all private sector industries for the same calendar year
Measures of Frequency:	Average number of employed persons in high morbidity risk 2000 Bureau of the Census occupations* Percentage of employed persons in high morbidity risk 2000 Bureau of the Census occupations * The occupations comprising "high morbidity risk" will be reviewed and updated every five years.
Time Period:	Calendar year
Significance and Background:	In 2008, the Bureau of Labor Statistics (BLS) reported an estimated 1.1 million injuries and illnesses that resulted in "days away from work", and a rate of 113.1 "days away from work" cases per 100,000 full-time-equivalent workers. The risk of these injuries and illnesses are significantly higher in certain occupations. Sixty-one occupational categories had "days away from work" injury and illness rates higher than 226.2 cases per 10,000 full-time-equivalent workers in 2008. These occupations accounted for approximately 18.4 million private sector workers in the U.S. (16.1 % of the private sector employment, excluding self-employed and unpaid workers), but 44.1% of OSHA "days away from work" cases in 2008.
Rationale:	Work-related injuries and illnesses are preventable, and control of occupational hazards is the most effective means of prevention. Concentrating on high-risk occupations for non-fatal injuries and illnesses helps prioritize limited resources.
Limitations of Indicator:	Differences in regional industrial practices may cause the ranking of high-risk occupations within a specific state or industry to differ from those identified from national data.
Data Resources:	Bureau of Labor Statistics' Current Population Survey (CPS) (numerator and denominator)
Limitations of Data Resources:	The BLS annual Survey of Occupational Injuries and Illnesses (SOII) is based on injury and illness data maintained by employers and is subject to sampling error, a function of BLS using a probability sample and not a census of all employers. Excluded from the survey are the military, self-employed individuals, farms with fewer than 11 employees, and Federal agencies. The CPS can be used to estimate the private sector employment in the US, excluding the self-employed, but may not match perfectly those workers covered in the SOII.
HP2020 Objectives:	None
CSTE Positions:	None
Other Available Data:	The BLS SOII and the CPS provide occupation data for some states.
Recommendations:	States could additionally identify their own state-specific high-risk occupations and assess associated employment patterns.

PERCENTAGE OF WORKERS EMPLOYED IN OCCUPATIONS AT
HIGH RISK FOR OCCUPATIONAL MORBIDITY

15.1 Number of Employed Persons in High Morbidity Risk 2002 Bureau of Census Occupations

The following are the high risk morbidity occupations based on Bureau of Labor Statistics "days away from work" cases and employment estimates for private sector workers for the year 2008. So that states may collect trend data for this indicator, this list will be used through 2012. CSTE will review and update this list every 5 years thereafter.

Table 1. List of 2007 Bureau of Census high risk occupations for occupational morbidity, 2008 (N = 61)

2002 BOC Occupation Code	2002 BOC Occupation Title
2720	Athletes, coaches, umpires, and related workers
3400	Emergency medical technicians and paramedics
3600	Nursing, psychiatric, and home health aides
3700	First-line supervisors/managers of correctional officers
3850	Police and sheriff patrol officers
3860	Transit and railroad police
3900	Animal control workers
4120	Food servers, non-restaurant
4210	First-line supervisors/managers of landscaping, lawn service, and grounds keeping
4220	Janitors and building cleaners
4230	Maids and housekeeping cleaners
4350	Nonfarm animal caretakers
4550	Transportation attendants
5410	Reservation and transportation ticket agents and travel clerks
5530	Meter readers, utilities
6120	Forest and conservation workers
6210	Boilermakers
6220	Brick masons, block masons, and stonemasons
6230	Carpenters
6260	Construction laborers
6310	Pile-driver operators
6360	Glaziers
6440	Pipe layers, plumbers, pipefitters, and steamfitters
6500	Reinforcing iron and rebar workers
6510	Roofers
6530	Structural iron and steel workers
6730	Highway maintenance workers
6760	Miscellaneous construction and related workers
6840	Mining machine operators
6910	Roof bolters, mining

7140	Aircraft mechanics and service technicians
7160	Automotive glass installers and repairers
7200	Automotive service technicians and mechanics
7210	Bus and truck mechanics and diesel engine specialists
7310	Heating, air conditioning, and refrigeration mechanics and installers
7330	Industrial and refractory machinery mechanics
7420	Telecommunications line installers and repairers
7510	Coin, vending, and amusement machine servicers and repairers
8140	Welding, soldering, and brazing workers
8160	Lay-out workers, metal and plastic
8520	Model makers and patternmakers, wood
8530	Sawing machine setters, operators, and tenders, wood
8610	Stationary engineers and boiler operators
8850	Cementing and gluing machine operators and tenders
8860	Cleaning, washing, and metal pickling equipment operators and tenders
8900	Cooling and freezing equipment operators and tenders
8910	Etchers and engravers
8920	Molders, shapers, and casters, except metal and plastic
8930	Paper goods machine setters, operators, and tenders
8940	Tire builders
8950	Helpers--production workers
8960	Production workers, all other
9120	Bus drivers
9130	Driver/sales workers and truck drivers
9140	Taxi drivers and chauffeurs
9240	Railroad conductors and yardmasters
9260	Subway, streetcar, and other rail transportation workers
9300	Sailors and marine oilers
9560	Hoist and winch operators
9620	Laborers and freight, stock, and material movers, hand
9730	Shuttle car operators

- Dataferrett is a US Census product described as a "data mining and extraction tool." Previously, users installed the DataFerrett application to their personal computer and ran programs from there. (These users can still use DataFerrett from their computer – if you are one of the users who in the past installed DataFerrett to your computer, skip down to "Previous & New Users" below.) New DataFerrett users will run the program from their internet browser.
- New Users: go to http://dataferrett.census.gov
  - On the homepage, you will find helpful information on DataFerrett on the righthand column, including a QuickTour, Tutorials, and a Users' Guide.
  - To initiate DataFerrett, click on "Launch BetaDataFerrett." (You will need to temporarily allow pop-ups).
- Previous & New Users: Register as user by typing in your e-mail address, and press "OK" to continue. (Do not select the Beta version.)
  - Click on "Step 1: Select Dataset and Variable" at the top of the page.

- Within "Select Dataset(s) to search", click on the + sign for "Current Population Survey", then click on the + sign for "Basic".
- Select all months from the year of interest by clicking on the first month in the range, then hold down the Shift key and click on the last month in the range. Then choose "View Variables" from the pop-up box.
- Select the following topics from the list that appears to the right: "Labor Force Variables", "Geography Variables", "Demographic Variables", and "Industry and Occupation Variables". Then click "Search Variables" at the bottom of that list.
- On the next screen all of the available variables for the selected tables will be displayed. Click "Name" to sort the variables alphabetically.
- To select the variables and value ranges of interest:
    - find "**GESTCEN**….Geography-Census state code" and double click to browse/select variables and values. Check the "Select" box on the pop-up screen, click "Deselect all values", then select your state code, and click "OK". Click "OK" again to confirm and add the variable to your DataBasket.
    - Find "**PEI01COW…** Indus.&Occ.-(main job) class of worker code" and double click to browse/select variables and values. Check the "Select" box on the pop-up screen, click "Deselect all values", then select "4 Private, For Profit" and "5 Private, Nonprofit" and click "OK". Click "OK" again to confirm and add the variable to your DataBasket.
    - find "**PEMLR**….Labor Force-employment status" and double click to browse/select variables and values. Check the "Select" box on the pop-up screen, click "Deselect all values", then select "1) Employed-At Work" and "2) Employed-Absent" and click "OK". Click "OK" again to confirm and add the variable to your DataBasket.
    - find "**PRTAGE**….Demographics – age" and double click to browse/select variables and values. Check the "Select" box on the pop-up screen and define value range from 16-90, then click "OK". Click "OK" again to confirm and add the variable to your DataBasket.
    - find "**PTIO1OCD**….Indus.&Occ.-(main job) occupation code" and double click to browse/select variables and values. Check the "Select" box on the pop-up screen, click "Deselect all values", then select the occupation codes of interest and click "OK". Click "OK" again to confirm and add the variable to your DataBasket.
- On the home page click "Step 2: DataBasket/Download/Make A Table".
- Click on the "Make A Table" icon. You will see an empty spreadsheet on the left side of your screen and a box on the right with the variables in the DataBasket.
- Use your mouse to drag the variable PTIO1OCD from the right side to the top left corner of the empty spreadsheet and click on "Go Get Data" on the toolbar.
- In a few seconds the table will be populated with a total employment number for all of the occupation groups, as well as employment counts for each individual occupation category. The first column in the first row of data should read "Total PTIO1OCD." The number in the field next to this is the **"Average number of employed persons in high morbidity risk occupations."**
- You can verify that you have selected the proper occupation codes by reviewing the list of occupations in the first column. The selections for the query are also provided in simple SAS code on the right side of the screen. Verify that you have selected your state

code, all the proper occupation codes, ages 16-90, PEMLR in (1, 2), and PEI01CO in (4, 5).

15.2 <u>Percentage Of Employed Persons In High Morbidity Risk 2000 Bureau Of Census Occupations</u>

a) To obtain the average annual number of employed persons:

- Follow the directions in 15.1, choose "Labor Force Variables", "Geography Variables", "Demographic Variables" and "Industry and Occupation Variables" in Step 1 then select "Search Variables".
- On the next screen all of the available variables for the selected tables will be displayed. Click "Name" to sort the variables alphabetically.
- To select the variables and value ranges of interest:
  - find "**GESTCEN**….Geography-Census state code" and double click to browse/select variables and values. Check the "Select" box on the pop-up screen, click "Deselect all values", then select your state code, and click "OK". Click "OK" again to confirm and add the variable to your DataBasket.
  - Find "**PEI01COW…** Indus.&Occ.-(main job) class of worker code" and double click to browse/select variables and values. Check the "Select" box on the pop-up screen, click "Deselect all values", then select "4 Private, For Profit" and "5 Private, Nonprofit" and click "OK". Click "OK" again to confirm and add the variable to your DataBasket.
  - find "**PEMLR**….Labor Force-employment status" and double click to browse/select variables and values. Check the "Select" box on the pop-up screen, click "Deselect all values" then select "1) Employed-At Work" and "2) Employed-Absent" and click "OK". Click "OK" again to confirm and add the variable to your DataBasket.
  - find "**PRTAGE**….Demographics – age" and double click to browse/select variables and values. Check the "Select" box on the pop-up screen and define value range from 16-90, then click "OK". Click "OK" again to confirm and add the variable to your DataBasket.
- On the home page, click "Step 2: DataBasket/Download/Make A Table".
- Click on the "Make A Table" icon. You will see an empty spreadsheet on the left side of your screen and a box on the right with the variables in the DataBasket.
- Use your mouse to drag the variable PEMLR from the right side to the top left corner of the empty spreadsheet and click on 'Go Get Data' on the toolbar.
- The first column in the first row of data should read "Total PEMLR". The number in the field next to this is the **"Average number of employed persons".**

b) <u>To calculate the percentage</u>:

- Divide the number of workers employed in high-risk occupations (15.1) by the number of employed persons (15.2a).

  Multiply this result by 100 to get the **"Percentage of workers employed in occupations at high risk for occupational morbidity."**

Topic: OCCUPATIONAL HAZARDS INDICATOR #16: PERCENTAGE OF WORKERS EMPLOYED IN INDUSTRIES AND OCCUPATIONS AT HIGH RISK FOR OCCUPATIONAL MORTALITY	
Demographic Group:	Employed persons
Numerator:	Employed persons age 16 years or older, in private sector industries and occupations at high risk for occupational mortality
Denominator:	Employed persons age 16 years or older, in all private industries for the same calendar year
Measures of Frequency:	Average number of employed persons in high mortality risk 2007 Bureau of the Census industries* Percentage of employed persons in high mortality risk 2007 Bureau of the Census industries Average number of employed persons in high mortality risk 2007 Bureau of the Census occupations* Percentage of employed persons in high mortality risk 2007 Bureau of the Census occupations * The industries and occupations comprising "high mortality risk" will be reviewed and updated every five years.
Time Period:	Calendar year
Significance and Background:	Each year, over 5,000 cases of work-related fatalities are reported to the Census of Fatal Occupational Injuries (CFOI) Program administered by the Bureau of Labor Statistics (BLS). On an average day, 14 workers die as a result of injuries sustained at work. The risks for these occupational fatalities are significantly higher in certain industries and occupations. Forty industries have fatality rates of 7.5 deaths per 100,000 workers or higher, and employed approximately 20.6 million workers (16.6% of the private sector employment), but account for 64% of the occupational fatalities in 2008. There are also 62 occupations that have fatality rates of 7.5 deaths per 100,000 workers or higher. These occupations account for approximately 16.1 million workers in the U.S. (13% of the private sector employment), but 66% of the occupational fatalities in 2008.
Rationale:	Multiple factors and risks contribute to work-related fatalities, including workplace and process design, work organization, worker characteristics, economics and other social factors. Surveillance of work-related fatalities can identify new hazards and case clusters, leading to the development of new interventions and development of new or revised regulations to protect workers. Concentrating on high-risk occupations and industries for fatalities helps prioritize limited resources.
Limitations of Indicator:	Differences in regional industrial practices may cause the ranking of high-risk occupations and industries within a specific State to differ from those identified from national data.
Data Resources:	Bureau of Labor Statistics' Current Population Survey (CPS) (numerator and denominator)
Limitations of Data Resources:	The CFOI program counts suicides at work as work-related fatalities, even when the cause of death may not be due to factors at work. CFOI does not count military deaths. To be consistent with Indicators #14 and #15, this indicator has been limited to private sector workers. Although, unlike Indicators #14 and #15, the self-employed are included.
HP2020 Objectives:	None
CSTE Positions:	None
Other Available Data:	The BLS CFOI and the CPS provide industry and occupation data for most States.
Recommendations:	States could report their own high-risk industries and occupations and associated employment patterns.

HOW-TO GUIDE – INDICATOR #16:

PERCENTAGE OF WORKERS EMPLOYED IN INDUSTRIES AND OCCUPATIONS AT HIGH RISK FOR OCCUPATIONAL MORTALITY

16.1 Average Number of Employed Persons in High Mortality Risk Industries

The following are the high mortality risk industries based on Bureau of Labor Statistics' Census of Fatal Occupational Injuries (CFOI). So that states may collect trend data for this indicator, this list will be used through 2012. CSTE will review and update this list every 5 years thereafter.

Table 1. List of high risk private sector industries for occupational mortality (N=40)

2007 Census Industry Code	2007 Census Industry Title
0170	Crop Production
0180	Animal Production
0190	Forestry, Except Logging
0270	Logging
0280	Fishing, Hunting, Trapping
0290	Support Activities for Agriculture and Forestry
0370	Oil and Gas Extraction
0380	Coal Mining
0390	Metal Ore Mining
0470	Nonmetallic Mineral Mining and Quarrying
0490	Support Activities for Mining
0770	Construction
1070	Animal Food, Grain, and Oilseed milling
1080	Sugar and Confectionery Products
2090	Miscellaneous Petroleum and Coal Products
2570	Cement, Concrete, Lime, and Gypsum Product Mfg.
2670	Iron and Steel Mills and Steel Product Mfg.
2690	Nonferrous Metal Production and Processing (Except Aluminum)
2770	Foundries
3680	Ship and Boat Building
3770	Sawmills and Wood Preservation
3780	Veneer, Plywood, and Engineered Wood Product Mfg.
4280	Recyclable Material Wholesalers
4480	Farm Product Raw Materials Wholesalers
4570	Farm supplies wholesalers
4585	Wholesale Electronic Markets, Agents, and Brokers
6080	Rail Transportation
6090	Water Transportation
6170	Truck Transportation
6190	Taxi and Limousine Service
6270	Pipeline Transportation

6280	Scenic and Sightseeing Transportation
6290	Services Incidental to Transportation
6590	Sound Recording Industries
7180	Other Consumer Goods Rental
7190	Commercial, Industrial, and Other Intangible Assets Rental and Leasing
7770	Landscaping Services
7790	Waste Management and Remediation Services
8690	Drinking Places, Alcoholic Beverages
8870	Commercial and Industrial Machinery and Equipment Repair and Maintenance

16.1a Number of Persons Employed in High Mortality Risk Industries

- Dataferrett is a US Census product described as a "data mining and extraction tool." Previously, users installed the DataFerrett application to their personal computer and ran programs from there. (These users can still use DataFerrett from their computer – if you are one of the users who in the past installed DataFerrett to your computer, skip down to "Previous & New Users"). New DataFerrett users will run the program from their internet browser.
- New Users: go to http://dataferrett.census.gov
  - On the homepage, you will find helpful information on DataFerrett on the righthand column, including a QuickTour, Tutorials, and a Users' Guide.
  - To initiate DataFerrett, click on "Launch BetaDataFerrett." (You will need to temporarily allow pop-ups).
- Previous & New Users: Register as user by typing in your e-mail address, and press "OK" to continue. (Do not select the Beta version.)
- Click on "Step1: Select Dataset and Variable" at the top of the page.
- Within "Select Dataset(s) to search", click on the + sign for "Current Population Survey", then click on the + sign for "Basic".
- Select all months from the year of interest by clicking on the first month in the range, then hold down the Shift key and click on the last month in the range. Then choose "View Variables" from the pop-up box.
- Select the following topics from the list that appears to the right: "Labor Force Variables", "Geography Variables", "Demographic Variables", and "Industry and Occupation Variables". Then click "Search Variables" at the bottom of that list.
- On the next screen all of the available variables for the selected tables will be displayed. Click on "Name" to sort the variables alphabetically.
- To select the variables and value ranges of interest:
  - find "**GESTCEN**………Geography-Census state code" and double click to browse/select variables and values. Check the "Select" box on the pop-up screen, click "Deselect all values", then select your state code, and click "OK". Click "OK" again to confirm and to add the variable to your DataBasket.
  - Find "**PEIO1COW…** Indus.&Occ.-(main job) class of worker code" and double click to browse/select variables and values. Check the "Select" box on the pop-up screen, click "Deselect all values", then select "4 Private, For Profit" , "5 Private, Nonprofit", " 6 Self-Employed, Incorporated", and "7 Self-Employed, Unincorporated" and click "OK". Click "OK" again to confirm and add the variable to your DataBasket.

- find "**PEIO1ICD**………Indus.&Occ.-(main job) industry code" and double click to browse/select variables and values. Check the "Select" box on the pop-up screen, click "Deselect all values", then select the occupation codes of interest and click "OK". Click "OK" again to confirm and add the variable to your DataBasket.
- find "**PEMLR**………Labor Force-employment status" and double click to browse/select variables and values. Check the "Select" box on the pop-up screen, click "Deselect all values", then select "1) Employed-At Work" and "2) Employed-Absent", and click "OK". Click "OK" again to confirm and add the variable to your DataBasket.
- find "**PRTAGE**……… Demographics – age" and double click to browse/select variables and values. Check the "Select" box on the pop-up screen and define value range from 16-90, then click on "OK". Click "OK" again to confirm and add the variable to your DataBasket.
- On the home page, click "Step 2: DataBasket/Download/Make A Table".
- Click on the "Make A Table" icon. You will see an empty spreadsheet on the left side of your screen and a box on the right with the variables in the DataBasket.
- Use your mouse to drag the variable PEIO1ICD from the right side to the top left corner of the empty spreadsheet and click on "Go Get Data" on the toolbar.
- In a few seconds the table will be populated with a total employment number for all of the industries, as well as employment counts for each individual industry. The first column in the first row of data should read "Total PEIO1ICD". The number in the field next to this is the **"Average number of employed persons in high mortality risk industries".**
- You can verify that you have selected the proper industry codes by reviewing the list of industries in the first column. The selections for the query are also provided in simple SAS code on the right side of the screen. Verify that you have selected your state code, all the proper industry codes, ages 16-90, PEMLR in (1,2), and PEI01CO in (4, 5, 6,& 7).

16.2   Percentage of Employed Persons in High Mortality Risk Industries
a) To obtain the average annual number of employed persons:
- Follow the directions in 16.1, choose "Labor Force Variables", "Geography Variables", "Demographic Variables" and "Industry and Occupation Variables" in Step 1 then select "Search Variables".
- On the next screen all of the available variables for the selected tables will be displayed. Click "Name" to sort the variables alphabetically.
- To select the variables and value ranges of interest:
  - find "**GESTCEN**……… Geography-Census state code" and double click to browse/select variables and values. Check the "Select" box on pop-up screen, click "Deselect all values", then select your state code, and click "OK". Click "OK" again to confirm and add the variable to your DataBasket.
  - find "**PEIO1COW…** Indus.&Occ.-(main job) class of worker code" and double click to browse/select variables and values. Check the "Select" box on the pop-up screen, click "Deselect all values", then select "4 Private, For Profit" , "5 Private, Nonprofit", " 6 Self-Employed, Incorporated", and "7 Self-Employed,

Unincorporated" and click "OK". Click "OK" again to confirm and add the variable to your DataBasket.

- find "**PEMLR**…… Labor Force-employment status" and double click to browse/select variables and values. Check the "Select" box on next pop-up screen, click "Deselect all values", then select "1) Employed-At Work" and "Employed-Absent" and click "OK". Click "OK" again to confirm and add the variable to your DataBasket.
- find "**PRTAGE**………Demographics – age" and double click to browse/select variables and values. Check the "Select" box on the pop-up screen and define value range from 16-90, then click "OK". Click "OK" again to confirm and to add the variable to your DataBasket.

- On the home page, click the second tab, "Step 2: DataBasket/Download/Make A Table".
- Click on the "Make A Table" icon. You will see an empty spreadsheet on the left side of your screen and a box on the right with the variables in the DataBasket.
- Use your mouse to drag the variable PEMLR from the right side to the top left corner of the empty spreadsheet and click on "Go Get Data" on the toolbar.
- The first column in the first row of data should read "Total PEMLR". The number in the field next to this is the **"Average annual number of employed persons".**

b) To calculate the percentage:
- Divide the number of workers employed in high-risk industries (16.1) by the number of employed persons (16.2a).

Multiply this result by 100 to get the **"Percentage of workers employed in industries at high risk for occupational mortality".**

16.3   Number of Employed Persons in High Mortality Risk Occupations
The following are the high risk mortality occupations based on Bureau of Labor Statistics' Census of Fatal Occupational Injuries (CFOI) and employment estimates for private sector workers for the year 2007.

Table 2. List of high risk private sector occupations for occupational mortality (n=62).

2007 Census Occ. Codes	2007 Occupation Title
0210	Farmers and Ranchers
2720	Athletes, Coaches, Umpires, and Related Workers
2800	Announcers
3740	Fire Fighters
3920	Security Guards and Gaming Surveillance Officers
3940	Crossing Guards
4210	First-line supervisors/managers of landscaping, lawn service, & groundskeeping workers
4240	Pest Control Workers
4250	Grounds Maintenance Workers

4540	Tour and Travel Guides
6000	First-line Supervisors/Managers of Farming, Fishing, and Forestry Workers
6050	Miscellaneous Agricultural Workers
6100	Fishers and Related Fishing Workers
6130	Logging Workers
6200	First-line Supervisors/Managers of Construction Traders and Extraction Workers
6210	Boilermakers
6220	Brick masons, Block masons, and Stonemasons
6250	Cement Masons, Concrete Finishers, and Terrazzo Workers
6260	Construction Laborers
6300	Paving, Surfacing, and Tamping Equipment Operators
6320	Operation Engineers and Other Construction Equip. Ops.
6350	Electricians
6360	Glaziers
6400	Insulation Workers
6420	Painters, Construction and Maintenance
6510	Roofers
6530	Structural Iron and Steel Workers
6600	Helpers, Construction Trades
6730	Highway Maintenance Workers
6760	Miscellaneous Construction and Related Workers
6800	Derrick, Rotary Drill, and Service Unit Operators, Oil, Gas, and Mining
6820	Earth Drillers, Except Oil and Gas
6840	Mining Machine Operators
6920	Roustabouts, Oil and Gas
6940	Other Extraction Workers
7000	First-line Supervisors/Managers of Mechanics, Installers, and Repairers
7210	Bus and Truck Mechanics and Diesel Engine Specialists
7220	Heavy Vehicle and Mobile Equipment Service Technicians and Mechanics
7340	Maintenance and Repair Workers, General
7350	Maintenance Workers, Machinery
7360	Millwrights
7410	Electronic Power-line Installers and Repairers
7560	Riggers
8100	Molders and Molding Machine Setters, Operators, and Tenders, Metal and Plastic
8140	Welding, Soldering, and Brazing Workers
8640	Chemical Processing Machine Setters, Operators, and Tenders
9030	Aircraft Pilots and Flight Engineers
9130	Driver/Sales Workers and Truck Drivers
9140	Taxi Drivers and Chauffeurs
9150	Motor Vehicle Operators, All Other
9200	Locomotive Engineers and Operators
9230	Railroad Brake, Signal, and Switch Operators
9240	Railroad Conductors and Yardmasters
9300	Sailors and Marine Oilers
9310	Ship and Boat Captains and Operators
9330	Ship Engineers

9360	Service Station Attendants
9500	Conveyor Operators and Tenders
9510	Crane and Tower Operators
9600	Industrial Truck and Tractor Operators
9720	Refuse and Recyclable Material Collectors
9750	Material Moving Workers, All Other

- To obtain the total employment in high-risk occupations, follow directions for 16.1a. Instead of selecting "**PEIO1ICD**………Indus.&Occ.-(main job) industry code" , select "**PTIO1OCD**… Indus.&Occ.-(main job) occupation code". Select the PTIO1OCD codes using the list of codes in Table 2.

16.4 <u>Percentage of Employed Persons in High Mortality Risk Occupations</u>
a) <u>To obtain the denominator for the percentage</u>:
- Follow directions for 16.2a.

b) <u>To calculate the percentage</u>:
- Divide the number of workers employed in high-risk occupations (16.3) by the number of employed persons (16.2a).
- Multiply this result by 100 to get the **"Percentage of employed persons in occupations at high risk for occupational mortality".**

Topic:	INTERVENTION RESOURCES FOR OCCUPATIONAL HEALTH
INDICATOR #17:	**OCCUPATIONAL SAFETY AND HEALTH PROFESSIONALS**
Demographic Group:	Employed persons.
Numerator:	1. Number of board-certified occupational medicine physicians 2. Number of members of the American College of Occupational and Environmental Medicine (ACOEM) 3. Number of board-certified occupational health nurses 4. Number of members of the American Association of Occupational Health Nurses (AAOHN) 5. Number of board-certified industrial hygienists 6. Number of members of the American Industrial Hygiene Association (AIHA) 7. Number of board certified safety health professionals (BCSP) 8. Number of members of the American Society of Safety Engineers (ASSE)
Denominator:	Employed persons age 16 years or older for the same calendar year
Measures of Frequency:	1. Number of board-certified occupational medicine physicians. 2. Rate of board-certified occupational medicine physicians per 100,000 employees. 3. Number of members of ACOEM. 4. Rate of ACOEM membership per 100,000 employees. 5. Number of board-certified occupational health nurses. 6. Rate of board-certified occupational health nurses per 100,000 employees. 7. Number of members of AAOHN. 8. Rate of AAOHN membership per 100,000 employees. 9. Number of board-certified industrial hygienists. 10. Rate of board-certified industrial hygienists per 100,000 employees. 11. Number of members of AIHA. 12. Rate of AIHA membership per 100,000 employees. 13. Number of BCSP. 14. Rate of board certified safety health professionals per 100,000 employees. 15. Number of members of ASSE. 16. Rate of ASSE membership per 100,000 employees.
Time Period:	Calendar year.
Significance and Background:	Physicians with training and/or special interest in occupational medicine provide both primary, secondary and tertiary occupational health preventive services. In 1989, the American Medical Association recommended that there be one physician per 1,000 employees. Occupational health nurses provide a great deal of the onsite occupational health care. Industrial hygienists and safety professionals are typically the primary individuals responsible for evaluating workplaces and making recommendations to prevent occupational injuries and illnesses.
Rationale:	Work-related injuries and illnesses are preventable. It is important to determine if there are sufficient trained personnel to implement occupational health preventive services.
Limitations of Indicator:	Other important occupational health specialties such as fire prevention, health physicists, ergonomists are not included.
Data Resources:	American Board of Preventive Medicine (ABPM) diplomates database (www.abprevmed.org). (#1,2) Annual roster of members of the ACOEM (www.acoem.org). (#3,4) American Board of Occupational Health Nurses Directory (www.abohn.org). (#5,6) Annual roster of members of the AAOHN member directory (www.aaohn.org). (#7,8) American Board of Industrial Hygiene (www.abih.org). (#9,10) AIHA member directory (www.aiha.org). (#11,12)

	BCSP member directory (www.bcsp.org). (#13,14) ASSE member directory (www.asse.org). (#15,16) Bureau of Labor Statistics Current Population Survey Data. (denominator)
Limitations of Data Resources:	The numerator data include retired individuals and individuals who may devote the majority of their time to research and limited or no time to provision of actual preventive services. An individual may practice part-time or even full-time in the field of occupational health and not be board certified or a member of the organization representing occupational health professionals. The completeness and frequency of updating addresses varies by each organization. Members are often listed in a database by a preferred address, which may not be the address where they practice.
<mark>**HP2020 Objectives:**</mark>	None
CSTE Positions:	None
Other Available Data:	None
Recommendations:	States could contact the occupational health specialists in the state to confirm address and assess status and nature of activity.

How-To Guide – Indicator #17:

OCCUPATIONAL SAFETY AND HEALTH PROFESSIONALS

To obtain the number of occupational safety and health professionals in each category:
Data for membership in board certified occupational health specialties and professional associations for your state can be acquired by calling Matthew Groenewold at NIOSH (gyr5@cdc.gov or 513-841-4329).

NOTE: This is administrative data that changes over time. Therefore, these data are collected at the same time each year.

To obtain the denominator for the rate:
- Go to http://www.bls.gov/gps/#tables to access the Geographic Profile of Employment and Unemployment (GPS) which contains Current Population Survey estimates for state-specific numbers of employed persons
- Under heading "TABLES CREATED BY BLS:"
- "Employment status of the civilian noninstitutional population in states by sex, race, Hispanic or Latino ethnicity, marital status, and detailed age:"Note: Data from 1997 through 2003 can be found at http://www.bls.gov/opub/gp/laugp.htm
- Find pdf for '<<YEAR>> Annual Averages' for year of interest.
- Scroll down to find your state.
- Read the 'Total' row for your state and the 4th data column – 'Employment Number'. This is the **'Number of Employed persons age 16 years or older'** (in thousands). Multiply by 1000.

To calculate the rate:
- Divide the number of occupational safety and health professionals by the denominator.
Multiply this result by 100,000 to get the **'Rate of occupational health and safety professionals per 100,000 employed persons age 16 years or older'**

Topic:	**INTERVENTION RESOURCES FOR OCCUPATIONAL HEALTH**
INDICATOR #18: OSHA ENFORCEMENT ACTIVITIES	
Demographic Group:	Employed persons.
Numerator:	Total number of OSHA inspections
	Total number of employed persons covered by OSHA inspections
Denominator:	Estimated number of establishments under OSHA jurisdiction
	Estimated number of employees under OSHA jurisdiction for the same calendar year
Measures of Frequency:	Annual number of establishments inspected by OSHA
	Estimated percentage of all establishments under OSHA jurisdiction inspected by OSHA
	Annual number of employees whose work areas were inspected by OSHA
	Estimated percentage of all employees under OSHA jurisdiction whose work areas were inspected
Time Period:	Calendar year
Significance and Background:	In 1970, Congress established the Occupational Safety and Health Administration (OSHA). The OSHA mission is to "assure so far as possible every working man and woman in the nation safe and healthful working conditions". This mandate involves the application of a set of tools by OSHA (e.g., standards development, enforcement, compliance assistance). OSHA conducts both referral and non referral inspections on work-sites. Work-sites are selected into an emphasis program for non referred inspections, randomly and on the basis of industry incidence rates of injuries. Investigations are inspections that are triggered by three events: fatality, catastrophe, or referral (including outside health/safety agency or media). All of the above on-site activities are called inspections for the statistical databases. Comprehensive information about inspections is found in the OSHA Field Inspection Reference Manual CPL 2.103, available on the OSHA web-site (http://www.osha.gov/Firm_osha_toc/Firm_toc_by_sect.html).
Rationale:	The measures of frequency for this indicator may approximate the added health and safety benefits and protections felt by workers as a result of their worksites being inspected.
Limitations of Indicator:	This indicator only measures enforcement activity and not other measures of OSHA activity such as education and compliance assistance. Because OSHA may conduct multiple inspections of the same establishment during the calendar year, the % of establishments inspected may be slightly overestimated. In addition, if OSHA conducts multiple inspections of the same worksite during the year, the number of workers covered by OSHA inspections may be over counted. In federal OSHA states and some OSHA state plan states, OSHA does not inspect farms with 10 or fewer employees. Agricultural establishments were excluded from the denominator in this indicator except for California and North Carolina; therefore, the percentages of establishments and employees covered may be overestimated in states that do inspect smaller farms.
Data Resources:	OSHA annual reports of total inspections conducted and the number of workers covered by these inspections (numerators).
	Bureau of Labor Statistics on Covered Employers and Wages (commonly referred to as the ES-202/CEW data http://www.bls.gov/cew/home.htm) for the number of workers employed and establishments in the public and private sectors (denominators).
Limitations of Data Resources:	Employers participating in an OSHA Voluntary Protection Program (VPP) or the Safety and Health Achievement and Recognition Program (SHARP) are exempted from routine inspections. Excluding workers from these programs will reduce the numerator, resulting in an underestimate of the protective function. In CEW data, individuals holding more than one job are counted multiple times.
HP2020 Objectives:	None
CSTE Positions:	None
Other Available Data:	Other indicators can be generated from the VPP and SHARPS program, the local emphasis programs and the participants of the 21D consultation program. Other data that can be generated from the inspections include type of violations and penalties, the number of all workers at the

	work-site inspected, union affiliation, inspection type, local or national emphasis initiatives, inspection and investigation reports by industrial classification and employer's name.
Recommendations:	Collaborate with state or regional OSHA Office to obtain more detailed information on the above.

HOW-TO GUIDE – INDICATOR #18

OSHA ENFORCEMENT ACTIVITIES

18.1   Annual number of establishments inspected by OSHA in all OSHA-covered sectors

Data for annual number of establishments inspected by OSHA for years 2000-on for your state can be acquired by calling Matthew Groenewold at (513) 841-4329 or by e-mail at gyr5@cdc.gov.

From the data provided, obtain the number for TOTAL INSPECTIONS. This is the "**annual number of employer establishments inspected by OSHA**."

NOTE: These data will need to be collected for future years for all states from OSHA at one point in time each year. The procedure for doing so is detailed below. Please skip to section 18.2 if you have already obtained the data from CSTE.

a) Contact your federal or regional OSHA office to obtain OSHA Inspection reports with criteria #5 and 9 (also called INSP-5 and INSP-9 (state-plan states only)), which contain summary data on OSHA inspections and number of employees covered by these inspections for the calendar year. **Specify that you want the report for all sectors (private and/or public) over which OSHA has jurisdiction.** Regional office contact information can be found on the OSHA web site at www.osha.gov by scrolling to the bottom of the page and clicking on "OSHA Offices," then "Regional, Area Offices" and then selecting your region.

b) In your request, specify that you would like the following:
- The total number of OSHA inspections of establishments conducted within your state for the calendar year.
- The total number of employees covered by inspections in all covered sectors (i.e., private and federal only for federal states and all sectors for state-plan states).

c) On page 1 of the INSP-5 report, obtain the number for TOTAL INSPECTIONS. If your state has an INSP-9 report as well, add the total inspections from each report for a grand total. This will yield the **"Annual number of establishments inspected by OSHA"**.

d)   On page 2 of the INSP-5/INSP-9 report under "Employee information," obtain the number for EMPLOYMENT COVERED. This will yield the "**Annual number of employees whose work areas were inspected by OSHA"**.

NOTE: OSHA sometimes conducts inspections that are limited to reviewing OSHA logs at the worksites. These are called "Records Inspections" and are included in the number of Total Inspections. Typically the number of records inspections will be small relative to total inspections, so including these as part of the total should not have any substantial effect on the estimates.

Useful state data on OSHA inspections is also available at http://www.osha.gov/oshstats/index.html. However the numbers of inspections for states may differ slightly from those included in the INSP-5 and INSP-9 reports, which are to be

used in generating this indicator. The OSHA web site does not include information about number of employees covered.

18.2A   Number of OSHA-Covered Establishments that are Eligible for OSHA Inspections

1) Go to the BLS web site http://www.bls.gov/cew/data.htm.
2) Access your state's ES-202/QCEW statistics. Next to "State and County Wages" **click the yellow box "Multi-screen Data Search."**
[For 2000 and prior years, find "Discontinued Data Series." Under the heading "Create Customized Tables (multiple screens)", click on "Industry Data – (SIC basis)." Select "OZ All Industries" and follow from 4) below.].
3) In the first screen **select the first option "Total, all Industries,"** then **select next form**
4) S**elect state**. For example, "25000- Massachusetts- Statewide," then **select next form.**
5) **Select the relevant ownership sector(s)** for your search (i.e. federal and private for federal OSHA states; all options "Total Covered" for state-plan OSHA states.) Depress the CTRL key to select more than 1 sector.
6) **Select "Number of Establishments,"** then **select next form.**
7) **Select "All Establishment Sizes."** then **select next form**
8) Review the form and **select "Retrieve Data."**
9) Sum the **Annual Number** of establishments for the year of interest for all resulting tables. This is the average total number of OSHA-covered establishments in your state that are eligible for OSHA inspection.
10) Go to 18.2B to exclude mines and farms from this denominator

18.2B   Number of OSHA-Covered Establishments that are Eligible for OSHA Inspections (EXCLUDING MINES AND FARMS)

1) Adjust denominator (18.2A) for exclusion of mines and farms in the numerator (18.1).

   NOTE: Mines are not covered by OSHA. For states that know their OSHA inspects all farms including farms with less than 10 employees, don't exclude agriculture from the denominator. Include this in a footnote when you submit your data.

2) Follow 1) and 2) in 18.2A above. In the first screen, **depress the CTRL key to select the NAICS codes 111,112,212,213)** (Crop Production, Animal Production, Mining except Oil and Gas, and Support Activities for Mining), then **select next form**
   [For 2000 and prior years, select only the following SIC codes: SIC 01 (Agricultural Production Crops), SIC 02 (Agricultural Production Livestock), SIC 10 (Metal Mining), SIC 12 (Coal Mining), and SIC 14 (Nonmetallic Minerals exc. Fuels),]

3) **Select state**. (ex. 25000- Massachusetts – Statewide)
4) **Select the relevant ownership sector(s)**
5) **Select, "Number of Establishments"**
6) **Select, "All Establishment Sizes"**
7) **Select, "Retrieve Data"**

8) Sum the annual number of establishments for the year of interest for all resulting tables **(NAICS 111, 112, 212, 213).**

9) Subtract this sum from the number of establishments in18.2A to get the final denominator, "Average number of OSHA-covered establishments in the state (excluding mines and farms) that are eligible for inspection". *[18.2A – total # of mines & farms = final denominator (18.2B)]*

18.3   Percentage of OSHA-Covered Establishments Eligible for Inspection that were Inspected by OSHA

To calculate the percentage:

- Divide the numerator (18.1) by the **final denominator** adjusted for mines and farms (18.2B).
- Multiply by 100 to obtain the "**Percentage of all OSHA-covered establishments eligible for inspection that were inspected by OSHA"**.

18.4   Annual Number of Employees Whose Work Areas were Inspected by OSHA

Data for your state's annual number of employees whose work areas were inspected by OSHA for years 2000-on can be acquired by calling Matthew Groenewold at (513) 841-4329 or by e-mail at gyr5@cdc.gov.

From the data provided, obtain the number for EMPLOYMENT COVERED. This is the **"annual number of employees whose work areas were inspected by OSHA".**

18.5A   Number of OSHA-Covered Employees in the State that are Eligible for Inspection

1) Go to the BLS web site http://www.bls.gov/cew/data.htm**.**

2) Access your state's ES-202/QCEW statistics. Next to "State and County Wages" **click the yellow box "Multi-screen Data Search."**

[For 2000 and prior years, find "Discontinued Data Series." Under the heading "Create Customized Tables (multiple screens)", click on "Industry Data – (SIC basis)." Select "OZ All Industries" and follow from 4) below.]

3) In the first screen **select the first option "Total, all Industries,"** then **select next form**

4) S**elect state**. For example, "25000- Massachusetts- Statewide," then **select next form.**

5) **Select the relevant ownership sector(s)** for your search (i.e. federal and private for federal OSHA states; all options "Total Covered" for state-plan OSHA states.) Depress the CTRL key to select more than 1 sector.

6) **Select "All Employees,"** then **select next form.**

7) **Select "All Establishment Sizes."** then **select next form**

8) Review the form and **select "Retrieve Data."**

9) Sum the annual number of employees for the year of interest for all resulting tables. This is the average total number of OSHA-covered employees in the state.

10) Go to 18.5B to exclude mines and farms from this denominator

18.5B   Number of OSHA-Covered Employees in the State that are Eligible for Inspection (EXCLUDING MINERS AND FARMERS)

1) Adjust denominator (18.5A) for exclusion of miners and farmers in the numerator (18.4).

   NOTE: Mines are not covered by OSHA. For states that know their OSHA inspects all farms including farms with less than 10 employees, don't exclude agriculture from the denominator. Include this in a footnote when you submit your data.

2) Follow 1) and 2) in 18.5A above. In the first screen, **depress the CTRL key to select the NAICS codes 111,112,212,213)** (Crop Production, Animal Production, Mining except Oil and Gas, and Support Activities for Mining), then **select next form**
   [For 2000 and prior years, select only the following SIC codes: SIC 01 (Agricultural Production Crops), SIC 02 (Agricultural Production Livestock), SIC 10 (Metal Mining), SIC 12 (Coal Mining), and SIC 14 (Nonmetallic Minerals exc. Fuels),]

3) **Select state**. (ex. 25000- Massachusetts – Statewide)
4) **Select the relevant ownership sector(s)**
5) **Select, "All Employees"**
6) **Select, "All Establishment Sizes"**
7) **Select, "Retrieve Data"**
8) Sum the **Annual Number** of establishments for the year of interest for all resulting tables **(NAICS 111, 112, 212, 213).**
9) Subtract this sum from the number of employees in18.5A to get the final denominator, "Average number of OSHA-covered employees in the state (excluding miners and farmers) that are eligible for inspection". *[18.5A – total # of miners & farmers = final denominator (18.5B)]*

18.6   Percentage of OSHA-Covered Employees Eligible for Inspection Whose Work Areas were Inspected by OSHA

c) To calculate the percentage:
- Divide the numerator (18.4) by the denominator adjusted for miners and farmers (18.5B).
- Multiply by 100 to obtain the "**Percentage of all OSHA-covered employees eligible for inspection whose work areas were inspected by OSHA.**"

Topic:	SOCIOECONOMIC IMPACT OF OCCUPATIONAL INJURIES AND ILLNESSES

INDICATOR #19:   WORKERS' COMPENSATION AWARDS

Demographic Group:	Employed persons
Numerator:	Total amount of workers' compensation benefits paid
Denominator:	Number of workers with workers' compensation coverage for the same calendar year Total employed civilians 16 years and older
Measures of Frequency:	Total amount of workers' compensation benefits paid Average amount of workers' compensation benefits paid per covered worker
Time Period:	Calendar year
Significance and Background:	In 2009, $58.3 billion in workers' compensation benefits were paid to workers with occupational injuries or illnesses. Workers' compensation employer costs decreased 7.6 percent in 2009, the largest decrease in twenty years. Benefits for medical care decreased in 2009 by 1.1 percent while cash benefits increased 1.9 percent.
Rationale:	Workers' compensation awards are reviewed to establish whether the reported medical condition is work-related. Accepted awards represent known work-related injuries and illnesses, and often more severe cases. The total and average amounts of benefits paid estimate the burden of these events, which can help justify prevention programs and activities.
Limitations of Indicator:	This is a gross indicator of the burden of occupational injury and illness. It does not include human, noneconomic costs nor all the economic costs associated with occupational injuries and illnesses. These data are more appropriate for evaluating trends within a state rather than comparisons between states because of differences in wages and medical costs, the compensation determination, industry types and risks, and policies on permanent disability payments. Even within a state, changes in policies, wages and medical care expenses must be considered.
Data Resources:	National Academy of Social Insurance (www.nasi.org).
Limitations of Data Resources:	Workers' compensation data is not complete, as many individuals with work-related illnesses do not file for workers' compensation. Self-employed individuals (e.g. farmers, independent contractors and small business owners), corporate executives, domestic and agricultural workers may be exempt from coverage. Additionally, federal employees, railroad, long shore and maritime workers are not covered by state workers' compensation systems. Compensation award payments are frequently made over time, thus annual awards may not reflect the full cost of, injuries and illnesses for a given year.
HP2020 Objectives:	OSH-2
CSTE Positions:	None
Other Available Data:	NASI tables with state-specific data have included: Number of Workers Covered by Workers' Compensation and Total Covered Wages Workers' Compensation Benefits by Type of Insurer and Medical Benefits
Recommendations:	NASI also provides the employers' costs for workers' compensation. State workers' compensation system and state employment data may provide additional information about incidence and costs that would increase the usefulness of these data for prevention efforts. States may supply industry- and occupation-specific counts, costs and rates of accepted workers' compensation claims. Age and gender can also be used to better define the burden of occupational injuries/illnesses. Many states report data collected for the subset of accepted time-loss claims—those involving days away from work—which are likely to have the highest costs to and affects upon workers and employers.

How-To Guide – Indicator #19:

WORKERS' COMPENSATION AWARDS

19.1 <u>Total amount of workers' compensation benefits paid</u>
- Go to National Academy of Social Insurance web site: http://www.nasi.org.
- Click on menu "Research"
- Click on "Workers' Compensation".
- Click on report entitled: "Workers' Compensation: Benefits, Coverage, and Costs, **<<YEAR>>.**"
- Click on 'Download' (must have Adobe Acrobat).
- Go to Table titled "Workers' Compensation Benefits by State, **<<YEARS>>** (in thousands)".
- Identify state and read 'total' column for appropriate year. Multiply by 1,000.

19.2   <u>Average amount of workers' compensation paid per covered worker</u>
- Go to National Academy of Social Insurance web site: http://www.nasi.org.
- Click on menu "Research".
- Click on "Workers' Compensation".
- Click on report entitled: "Workers' Compensation: Benefits, Coverage, and Costs, **<<YEAR>>.**"
- Click on 'Download' (must have Adobe Acrobat).
- Go to Table titled "Number of Workers Covered by Workers' Compensation and Total Covered Wages, by State, **<<YEARS>>**".
- Identify state and read column for 'Covered Workers (in thousands)' for year of interest. Multiply by 1,000.

b) <u>To calculate the average amount of workers' compensation benefits paid per covered worker:</u>
- Divide the numerator (19.1) by the denominator (19.2) – expresses the result in dollars per covered worker.

Topic:	CUMULATIVE OCCUPATIONAL INJURY

INDICATOR #20: **WORK-RELATED LOW BACK DISORDER HOSPITALIZATIONS**

Demographic Group:	Employed persons
Numerator:	Hospital discharges for low back disorders with primary payer coded as workers' compensation
Denominator:	Employed persons age 16 years or older for the same calendar year
Measures of Frequency:	Annual number of work-related surgical low back disorder hospitalizations for persons age 16 years or older (numerator) Annual rate of work-related surgical low back disorder hospitalization per 100,000 employed persons age 16 years or older Annual number of work-related low back disorder hospitalizations for persons age 16 years or older (numerator) Annual rate of work-related low back disorder hospitalization per 100,000 employed persons age 16 years or older
Time Period:	Calendar year
Significance and Background:	Each year 15-20% of Americans report back pain, resulting in over 100 million workdays lost and more than 10 million physician visits. National Health Interview survey data estimates that two-thirds of all low back pain cases are attributable to occupational activities. The cost of back pain is also disproportionate, as it represents about 20% of workers' compensation claims, but nearly 40% of the costs. In 2003, 3.2% of the total U.S. workforce experienced a loss in productive time due to back pain. The total cost of this productive time lost to back pain is estimated to be in excess of $19.8 billion dollars.
Rationale:	Hospitalizations for work-related back disorders have serious and costly effects including: high direct medical costs, significant functional impairment and disability, high absenteeism, reduced work performance, and lost productivity. Well-recognized prevention efforts can be implemented for high risk job activities and reduce the burden of work-related low back disorders.
Limitations of Indicator:	Hospital discharge records are only available for non-federal, acute care hospitals. Many individuals with work-related injuries do not file for workers' compensation or fail to recognize work as the cause of their injury. Additionally, self-employed individuals such as farmers and independent contractors, federal employees, railroad or longshore and maritime workers are not covered by state workers' compensation systems. The expected payer on hospital discharge records may not be accurate and reflect the actual payer. Data between states may not be comparable due to differences in benefit adequacy in states' workers' compensation programs. Trends in the use of outpatient surgical centers may limit the interpretation of this indicator. The indicator utilizes only the first seven diagnosis and four procedure code fields to include and exclude cases. Many states have more diagnosis and procedure code fields that could be used to include and exclude cases. The indicator excludes patients hospitalized outside their state of residence.
Data Resources:	Hospital discharge data (numerator) BLS Current Population Survey Data (denominator)
Limitations of Data Resources:	Practice patterns and benefit payment systems may affect decisions by health care providers to hospitalize patients, to correctly diagnose work-related conditions, authorize surgery and/or to list the condition as a discharge diagnosis. All admissions are counted, including multiple admissions for a single individual. Until hospital discharge data are available in all states, aggregation of state data to produce nationwide estimates will be incomplete. Data on race/ethnicity are not collected or may be incomplete in some states.
HP2020 Objectives:	OSH-2 and OSH-3

CSTE Positions:	None
Other Available Data:	Age, gender, race/ethnicity, diagnosis, residence zip code, hospitalization cost
Recommendations:	Age, gender, race/ethnicity, zip code specific counts and rates can be used to better define the pattern of work-related hospitalizations. States that have access to statewide outpatient surgery data can compare trends of outpatient surgery for low back disorders to data from this indicator.

HOSPITALIZATIONS FOR WORK-RELATED LOW BACK DISORDERS*

This indicator has two measures: 1) Surgical low back disorder hospitalizations; and 2) all low back disorder hospitalizations. Initially surgical cases are identified. Then to obtain all low back disorder hospitalizations, non-surgical cases are identified and added to the surgical cases. Certain hospitalizations – those listed in Table 3 – are excluded because the conditions are likely related to trauma or a non-occupational disease.

A generic SAS program has been developed that will generate values for X.1 and X.3 below. The program requires minor modifications: state-specific variable names and value ranges must be inserted where indicated. The program is available separately.

20.1 <u>Annual number of work-related surgical low back disorder hospitalizations for persons age 16 years and over</u>
Obtain from the hospital discharge data file the number of cases meeting the following criteria:
- Definite surgical low back disorder hospitalizations are identified with a relevant diagnostic code (Table 1) in any of the first seven diagnosis fields <u>in</u> <u>combination</u> <u>with</u> a relevant surgical procedure code (Table 2) in any of the first four procedure fields. You must then exclude cases that have an exclusion criteria listed in Table 3, A or B.
- Primary payer = Workers' Compensation.
- Select for state of residence = '*your state.*'
- Exclude:
  - age unknown or <16 years old
  - out-of-state residents and unknown state of residence
  - out-of-state hospitalizations
- Use undeduplicated data (no exclusions for deaths, readmissions).
- Use discharge during calendar year, not fiscal year.
- Use all cases reported on the discharge file, regardless of length of stay.
- This will yield the **'Total annual number of work-related surgical low back hospitalizations for persons age 16 years or older.'**

20.2 <u>Annual crude rate of hospitalization for low back surgery per 100,000 employed persons age 16 years or older</u>
a) <u>To obtain the denominator for the rate:</u>
- Go to http://www.bls.gov/gps/#tables to access the Geographic Profile of Employment and Unemployment (GPS) which contains Current Population Survey estimates for state-specific numbers of employed persons.
- Scroll down to the heading "Tables created by BLS"
- Select the year of interest below the heading "Employment status of the civilian noninstitutional population…" (Note: data for 1997-2004 are available at: http://www.bls.gov/opub/gp/laugp.htm).
- Scroll down to your state.

- Read the 'Total' row for your state and the 4th data column – "Employment Number". This is the **'Number of Employed Persons 16 years of age or older'** (in thousands). Multiply by 1000.

b) <u>To calculate the rate:</u>
- Divide numerator (X.1) by the denominator (X.2a).
- Multiply this result by 100,000 to get the **'Annual crude rate of hospitalization for low back surgery per 100,000 employed persons age 16 years or older'**

20.3 <u>Annual number of work-related low back disorder hospitalizations for persons age 16 years and over</u>

In order to generate the total number of low back hospitalizations you first need to generate the number of non-surgical hospitalizations. This result is then added to the number of surgical hospitalizations (X.1). The procedure below generates the number of low back non-surgical hospitalizations.

Obtain from the hospital discharge data file the number of cases meeting the following criteria:
- Definite non-surgical low back disorder hospitalizations are identified with a relevant diagnostic code from Table 1 in any of the first seven diagnosis fields <u>excluding</u> cases identified by codes in Table 3, A or C.
- Primary payer = Workers' Compensation.
- Limit age to those 16 years and older.
- Select for state of residence = '*your state.*'
- Exclude:
  - age unknown
  - out-of-state residents and unknown state of residence
  - out-of-state hospitalizations
- Use undeduplicated data (no exclusions for deaths, readmissions).
- Use discharge during calendar year, not state or federal fiscal year.
- Use all cases reported on the discharge file, regardless of length of stay.
- This will yield the total annual number of work-related non-surgical low back hospitalizations for persons age 16 years or older. = "NON-SURGICAL CASES"
- Add "NON-SURGICAL CASES" and results from X.1 from the preceding step.
- This will yield the **'Total annual number of work-related low back hospitalizations for persons age 16 years or older.'**

20.4 <u>Annual crude rate of hospitalization for work-related low back disorder per 100,000 employed persons age 16 years or older</u>

<u>To calculate the rate:</u>
- Divide numerator (X.3) by the denominator (X.2a).
- Multiply this result by 100,000 to get the **'Annual crude rate of hospitalization for work-related low back disorders per 100,000 employed persons age 16 years or older'**

Table 1. Diagnostic categories and ICD-9-CM codes that are associated with low back disorders.

Diagnostic Category:	ICD-9-CM Codes:	Definitions:
	(All Seven Diagnosis Fields)	
Herniated Disc	722.10	Lumbar disc displacement without myelopathy
	722.73	Lumbar disc disorder with myelopathy
Probable degenerative changes	721.3	Lumbosacral spondylosis without myelopathy
	722.52	Lumbar or lumbosacral disc degeneration
	722.93	Other or unspecified lumbar disc disorder
Spinal stenosis	721.42	Lumbar spinal cord spondylogenic compression
	724.02	Lumbar stenosis
Possible instability	724.6	Sacral disorders including lumbosacral instability
	738.4	Acquired spondylolisthesis
	756.11	Lumbosacral spondylolysis
	756.12	Spondylolisthesis
Miscellaneous	722.32	Schmorl's node, Lumbar Region
	722.83	Lumbar postlaminectomy synd.
	724.2	Lumbago
	724.3	Sciatica
	739.3	Non-allopathic lesions, lumbar region.
	739.4	Non-allopathic lesions, sacral region.

Table 2. Procedural Categories and ICD-9-CM codes for identifying possible cases of low back surgery.

Procedural Category:	ICD-9-CM Procedure Codes:	Definition:
	(All Four Procedure Fields)	
Laminectomy	03.02, 03.09	Spinal cord exploration and decompression
Discectomy	80.50, 80.51, 80.59	Intervertebral disc excision or destruction
	80.52	Intervertebral chemonucleolysis
Fusion	81.00, 81.04-7, 81.09	Spinal fusion
	81.08	Spinal refusion
Other	03.6	Lysis of spinal cord or nerve root adhesion
	78.69	Removal of internal fixation device

Table 3. Exclusion criteria for surgical and non-surgical low back disorder cases

A. Exclusions from both surgical and non-surgical cases

Diagnostic Category	ICD-9 CM Diagnosis Code
Neoplasms	140.0 - 239.9
Intraspinal abscess and osteomyelitis	324.1, 730.0 - 730.99
Inflammatory spondyloarthropathies	720.0 – 720.9
Pregnancy	630 – 676
Vertebral fractures with spinal cord injury, open vertebral fractures, and vertebral dislocations	805 – 806.9, 839 -839.59

Procedural Category	ICD-9 CM Procedure Code
Chordotomy	03.20-0.3.29

B. Exclusions from surgical cases only

Diagnostic Category	ICD-9 CM Diagnosis Code
Pathological fractures	733.1, 733.13
Closed vertebral fractures without spinal cord injury	805.0, 805.2, 805.4, 805.6, 805.8
Cervical and thoracic disorders **(First diagnosis field only)**	353.2-353.3, 721.0-721.2, 721.41, 722.0, 722.11, 722.72, 722.81, 722.82, 722.91-722.92, 723.0, 723.4, 724.01

Procedural Category	ICD-9 CM Procedure Code
Cervical spinal fusions	81.01-81.03

C. Exclusions from non-surgical cases only

Procedural Category	ICD-9 CM Procedure Code
Back surgery	03.01-03.09, 03.1, 03.4-03.8, 03.93-03.94, 03.97-03.98, 80.5-80.59, 81.00, 81.04-81.09
Possible Back surgery	78.59, 78.69

* The algorithm to identify low back hospitalizations was derived from Cherkin DC, Deyo RA, Volinn E, Loeser JD: Use of the International Classification of Diseases (ICD-9-CM) to identify hospitalizations for mechanical low back problems in administrative databases. Spine 17:817-824, 1992.

APPENDIX A: ORIGINAL WORK GROUP MEMBERS

**NIOSH-CSTE OCCUPATIONAL HEALTH
SURVEILLANCE WORK GROUP**

OCCUPATIONAL HEALTH SURVEILLANCE INDICATORS

**For Tracking Work-Related Health Effects
And Their Determinants**

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Membership Information and Work Group Operating Guidelines are available online:
www.cste.org/webpdfs/OHIWorkgroupOperatingGuidelines.doc

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